AIR TRANSPORT IN INDIA

(GROWTH & PROBLEMS)

By
M. R. DHEKNEY, M.A., M.COM., PH.D.,
Late, 'Officer on Special Duty',
Ministry of Communications,
Government of India.,

Fergusson College, Poona,
Professor of Commerce and
Head of the Department of Commerce,
B. M. College of Commerce, Poona.

C. RS 11730

VORA & CO. PUBLISHERS LTD.
3, Round Building, BOMBAY - 2.

First Edition : April 1953.

Price: Rs. Six & As. Eight only.

Printed by J. S. Bhatt, New Age Printing Press, 190-B, Khetwadi Main Road, Bombay 4, and published by M. K. Vora for Vora & Co., Publishers Ltd., 3 Round Building, Bombay 2.

To

My parents

and

To

My brother

Dr. B. R. Dhekney

Karnatak College,

Dharwar

EDITOR'S PREFACE

The study of Economics of Transport has not received adequate attention in University courses in our country. In view of rapid developments in modern methods of communications and the increasing share of the State in the same, the time is overdue when adequate place should be given to the general study of problems of transport by all students of economics and also to more specialised study of the subject by those interested in the same. While this is generally true of all branches of transport, it is specially true of air transport. Whereas, we have literature on railways and shipping and some interest has been taken in their study, very little is known about the Economics of Air Transport. The progress in civil aviation has been fairly rapid in this country though it may not be as great as in other countries. The proposal to bring about a merger of civil aviation companies and entrust their working to public corporations indicates the importance that this industry plays in the public life of the country. The need for co-ordination of civil aviation with the Indian Air Force is obvious and this has also its own problems. The Indian public is not yet sufficiently air-minded. Travelling by air is not yet within the reach of the vast majority of the people because of its high cost. The time has, however, come when a better understanding of the subject by all classes of people may help in the desired progress. This book is an excellent attempt towards fulfilling this want. Dr. Dhekney is specially qualified to write on this subject. Besides being an academic worker in Economics and Commerce of long standing, he has had opportunities to work in the Ministry of Communications and with the Air Transport Inquiry Committee. It is hoped that the story of Indian Aviation presented in this book in a simple and non-technical manner will be read with interest by all concerned and will lead to a better understanding of the various problems which air transport presents in a country like ours.

C. N. VAKIL

School of Economics & Sociology,
University of Bombay,
Bombay, 28th March 1953.

AUTHOR'S NOTE

The purpose of this book is to explain the origin, the dynamic nature and the economic problems of the air transport industry in India. The publication has been essentially written for University students and for those who seek a career in the airline business as an introduction to the rapidly developing air transport industry in India. So far, very little has been written in India for the promotion of air age education and this project is a modest attempt in that direction. It is hoped that the publication may give some understanding of developing importance of air transport in India to those for whom it is mainly written.

Published literature on Civil Aviation in India is scanty. The annual progress reports on Civil Aviation in India have been discontinued since 1939. The half-yearly review of civil aviation in India released by Press Information Bureau, Government of India and the annual reports of the Indian airlines contain very limited information. Most of the data for the early history of Civil Aviation is still buried in the official files and is not available for study. Short-comings of this volume are, therefore, many. Though a certain amount of continuity has not been possible on account of insufficient data, an effort has been made to re-adjust the available material for presenting a connected account of the growth of air transport industry. The report of the Air Transport Inquiry Committee published in 1950 is the most weighty document on the subject. Though the author has drawn upon the report, considerable unpublished information, factual and statistical, has been incorporated in this volume. Most of it was collected by the author by personal interviews with the airline executives, visits to important airline centres and correspondence with the office of the Director General of Civil Aviation. The D.G.C.A. and all the members of his Department have been very generous in their assistance to the author at all stages of his study of the subject. When the author was on deputation to the Government of India in

1950 as an 'Officer on Special Duty', Ministry of Communications, for the work of the Air Transport Inquiry Committee, he had also an opportunity of studying the subject both from the angle of theory and of practice.

The author is indebted to the Hon'ble Mr. Justice G. S. Rajadhyaksha, Chairman of the Air Transport Inquiry Committee for his encouragement in undertaking this study. Space prevents mention of all the airline executives and members of the office of the Director General of Civil Aviation, who so kindly gave their time for interviews and correspondence. Among those whom I should like to thank in particular for their advice and assistance are Mr. D. Chakraverti, Dy. Director General of Civil Aviation, Mr. K. V. Venkatachalam, Deputy Secretary, Ministry of Communications, Dr. M. B. Sarwate, Director of Communications, Mr. A. Varadachari, Accounts Officer, Civil Aviation Department, Mr. J. L. Watkins, Superintendent of Organisation of Technical Services, Trans-Australia Airlines, Mr. K. C. Bakhle, Managing Director, Air-India International and Mr. E. Rajaram Rao, Member, Central Board of Revenue, Government of India. While the author is grateful to all those who have assisted him, he alone is responsible for the statements made, views expressed and for any errors in the factual or statistical data presented in the book. The author also acknowledges his indebtedness to the University of Poona for the grant-in-aid received by him from the University towards the cost of the publication of this book.

A final debt of gratitude is due to my teacher Professor C. N. Vakil, Director of the School of Economics and Sociology, University of Bombay, under whose guidance the author studied the subject and whose kindness and assistance have enabled the author to make this small contribution to the cause of air age education in India.

The author regrets that a few errors have crept in the course of printing. The corrections have been given in the Errata at the end of the book.

March 28, 1953.
Poona.

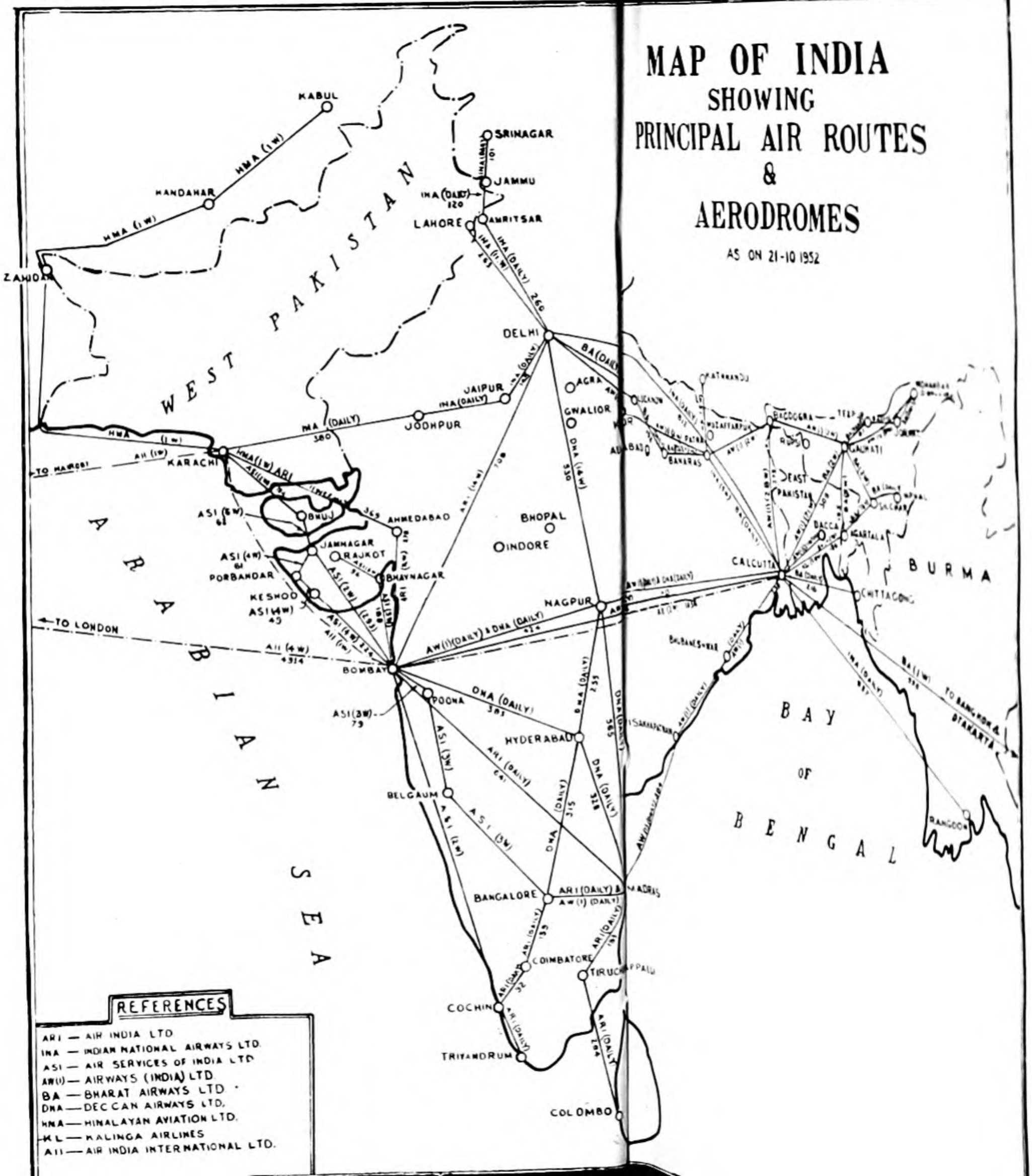
M. R. Dhekney

CONTENTS

Chapter		*Page*
I	Nature of Air Transportation	9
II	Problems of the Airline Operator	20
111	Early History of Air Transport in India	53
IV	Growth of Domestic Air Transport in India 1920-1938	67
V	War and Post-War Developments in Air Transport	82
VI	Principal Indian Airlines	99
VII	Airline Finance, Organisation & Personnel	118
VIII	Airline Revenues and Costs	138
IX	Air Transport Pricing	159
X	Air-Freight Service	177
XI	Growth of Non-Scheduled Air Transport in India	192
XII	Ground Organisation	201
XIII	Air Transport Licensing Board	218
XIV	International Relations	222
XV	Case for an Aircraft Industry in India	229
	Appendices	
	(A) Statement showing the Number of Pilots (Foreign and Indian) Employed by Air-line Operating Companies	241
	(B) A Note on literature on Civil Aviation in India	242
	(C) The Air Corporations Bill, 1953.	243
	Index	250

MAP OF INDIA
SHOWING
PRINCIPAL AIR ROUTES
&
AERODROMES

AS ON 21-10-1952



REFERENCES

ARI — AIR INDIA LTD
INA — INDIAN NATIONAL AIRWAYS LTD.
ASI — AIR SERVICES OF INDIA LTD
AW(I) — AIRWAYS (INDIA) LTD.
BA — BHARAT AIRWAYS LTD.
DNA — DECCAN AIRWAYS LTD.
HNA — HINALAYAN AVIATION LTD.
KL — KALINGA AIRLINES
AII — AIR INDIA INTERNATIONAL LTD.

CHAPTER I

NATURE OF AIR TRANSPORT

Air Transport is essentially a younger generation's heritage. It is also the youngest of all forms of transport. Before the first World War, air transport was an infant industry. Since then, it has made such a rapid progress that it is now a well established industry in most of the advanced countries of the world. The progress that the air transport has made after the World War II has brought the people of the world so close together that distance is now measured not in miles but in hours. The manner in which the aircraft has also played its role provides sufficient evidence that air services can now be regarded as an indispensable part of the modern transport system.

It has been further acknowledged that the economic structure of a country can be strengthened by modernisation of the transport system in which air transport plays an essential part in the internal and international communications. In fact, the contribution that air transport can make to the political and commercial advancement and to the security and defence of a country is out of all proportion to the size of the industry itself. It has been, therefore, the objective of all progressive countries to possess a civil fleet serving commerce and industry during peace time while remaining available for immediate conversion to military use in an emergency.

SPEED

The most striking characteristic of air transport that distinguishes it from the older forms of transport is its speed. The original Wright aeroplane that went into production in 1904 had a speed of 42 m.p.h. It carried two passengers and had about two hours gasoline supply with a service ceiling of 8000 feet. Since then,

there has been a continuous upward trend in the aircraft speed particularly for commercial purposes. By 1929, the maximum cruising speed that could be attained without running into excessive cost appeared to be 130 m.p.h. for a passenger aircraft. On the eve of last World War, it was a little over 190 m.p.h. for a machine of 20 passenger capacity. The aircraft which came to be introduced for commercial services after the termination of the last World War have been operated with reasonable economy at speeds of 300 m.p.h. Commenting in 1948 on the upward trend in the speeds of the commercial aircraft, Dr. Edward Warner has observed that commercially usable cruising speeds[1] have increased by about 150 per cent in the last twenty years—about 60 per cent in the last twelve, since the Dakota and the Empire flying boats appeared. The 60 per cent gain since 1936 has been the product of an increase of about 15 per cent due to supercharging of cabins and engines, and the consequent raising of the normal operating height from 10,000 to 20,000 feet or 25,000 feet; about 10 per cent due to the aerodynamic improvement that was the natural accompaniment of the increase of size from the Dakota to the Constellation, a little less than 5 per cent due to reduction in power loading; and from 20 to 25 per cent due to improvements in aerodynamic design.[2] The introduction of turbo-prop and turbo-jet has made a further advance and has made it possible to achieve speeds in excess of 500 miles per hour compared with current cruising speeds in the neighbourhood of 300 miles per hour and 190 miles at the end of the last war. But any advance in speed alone without the advantage of superior commercial economy would be impracticable.

For every aircraft with a given aerodynamic efficiency, there is an economic speed which makes for greatest economy in the flying cost. Any speed in excess

1 Cruising speed depends upon altitude, range to be covered, the fuel used and the weather conditions likely to be obtained.

2 Dr. Edward Warner: *Journal of Aeronautical Society of India*, Volume I, No. 2, August, 1949, p. 4.

of the economic limit may reduce payload and may spell higher costs as proportionately more power and fuel are required to produce it. Thus, for the Dakota which is largely used on the internal services in India, the most economic speed is 140 m.p.h. at an altitude of 10,000 feet. Actually, it cruises just over 180 m.p.h. at that altitude and pays for the higher speed by consuming about 15 per cent more fuel per mile flown than it would, if the pilot at all times holds strictly to the most economic speed.[3] As in the case of the Dakota, aircraft developed during the immediate post-war period can be operated with reasonable economy at speeds of 300 m.p.h. but as cruising speed approaches 400 m.p.h. or more direct operating expenses mount rapidly.

The speed that is more significant in air travel is the average attained from departure point to arrival at the unloading point at the destination. This is known as 'block to block' speed. Since, it drops sharply as the stage distance is reduced, its best advantage is available on non-stop services on optimum stage lengths without resorting to increased power with its greater cost. In India the normal range for internal services is less than 500 miles and a cruising speed of more than 250 m.p.h. would be of little advantage.[4] The underlying idea is that there is no point in cutting short the flying time when the waiting time for the passengers at the airport and in transportation between the booking office in the cities and the airport is considerable. High speeds are necessary when distances concerned between blocks are

[3] Dr. Edward Warner: Post-war Transport Aircraft. *J. R. Aero. S.*, July, 1943, p. 220; also *Foreign Affairs*, January, 1942, p. 346.

[4] The Punjab Mail of the Central Railways covers the 957 mile run from Bombay to Delhi in 29 hours and 30 minutes at an average speed of 32.4 miles per hour as against four hours by a non-stop air service between Bombay and Delhi (708, non-stop). The Deccan Queen on the electrified service covers the 119 miles run to Poona at an average speed of 37.6 m.p.h. and the Calcutta Mail via Nagpur averages 31 m.p.h. over the 520 miles run from Bombay to Nagpur.

of the order of 750 miles or more. A cruising speed of 250 m.p.h. with an operating altitude ranging from 7,000 to 10,000 feet for a 500 miles range will represent a block speed of about 225 miles and this is considered sufficient for short to medium-haul services. The aircraft is thus incomparably the fastest vehicle and has been able to obtain considerable share of the total movement of travellers in those countries where speed is valued most.

FLEXIBILITY

Air transport though not inherently very economical as compared with the older forms of transport enjoys a high degree of flexibility and independence of surface conditions. Both the railway and motor transport are tied down to a track which must be prepared in advance. On the other hand, air transport which requires relatively limited investment can operate wherever landing and navigation facilities are available. Further, the ground organisation, the airport, the communication and the navigation aids for the route organisation can normally be constructed for a total first cost of less than one-tenth the amount that would be required for railways. The ability to penetrate regions which cannot be served by modern transportation is the unique characteristic of air transportation. Many inaccessible areas in Canada, Alaska, Africa and South America have been thus opened by the aircraft. This flexibility in accommodating itself to any geographical situation has enabled aircraft to reach remote places with ease and comfort.

FREQUENCY

Aircraft is a highly flexible vehicle and can accommodate itself to the demands of its patrons both as to routing and frequency of operation. Although the capacity of the individual aircraft is limited, its potentialities for producing passenger-miles of transportation are great because of its speed. The motor bus is quite similar to the aircraft in this respect while a railway

passenger train presents a contrast to the two. If a load factor of 65 per cent is consistently available, the operator normally puts in an additional frequency. If enough traffic is available, the operator can depend upon good loads on every trip and can offer frequency of service that will satisfy the demands of the travelling public. On short-haul routes, the operator would naturally employ a small or medium-sized aircraft to take advantage of the small traffic that is available at frequent intervals. If the operator uses a standard type of aircraft, and offers large number of frequencies, he would be in a position to achieve a high degree of utilisation. If the volume of traffic shows a tendency to expand, the operator may also decide to operate a larger aircraft and may maintain the old frequency. The operator has therefore either to increase the frequencies or has to purchase a larger aircraft to meet the expanding volume of traffic. On the external routes, short or long, the operator's choice is strictly limited by bilateral agreements and he is compelled to restrict himself to the schedules agreed upon in the terms of the agreements. At the same time, it cannot be overlooked that the advantage of frequency diminishes with the increase in distance to be travelled. Long-haul routes, therefore, offer very restricted scope for frequency of service.

SAFETY

The question of safety in air transport is of supreme importance. It not only affects human life but has tremendous influence on the psychology of the travelling public upon whom the self-sufficiency of the airlines depends. It is a normal experience that traffic has a tendency to fall after an accident and it takes considerable time for an airline to win over again the prospective travellers. The cost of major and minor accidents is also a substantial charge on the revenues of the airlines. The large amount of publicity given to the airline accidents creates an impression that airline travel is not safe. Hence, education of the public has become an essential part in the publicity campaigns of the air-

lines. During the early years of air transport, airlines could not claim a satisfactory safety record. In the aviation history, the first large drop in passenger fatalities occurred between 1931-33 when the twin-engined aircraft was introduced. Another major improvement in the safety record was registered between 1937-1939 due to technological developments both in aircraft, and in airway installations. Improved de-icers, radar altimeters and blind-landing technique have all made a modern aircraft a highly reliable machine At the same time, steadily mounting safety equipment involves a sacrifice of payload and higher maintenance expenditure. Ultimately there is an economic limit for further additions as every airline has to balance the added cost against the payload which may not be able to bear any further sacrifice. A very significant contribution to safety record has recently been made by Instrument Landing System (ILS) and the Ground Control Approach (G.C.A.). Recent advances in electronic aids to air traffic control, navigation and landing will also assist the airlines to establish a highly efficient system of public transport. Great opportunities for future improvement, therefore, lie in the improvement of air navigation facilities, larger and better lighted aerodromes and strictest possible adherence to standard procedure on the part of the airline personnel. The gradual decline in the aviation insurance rates in the recent years also reflects the growth of safety in air transportation.

The introduction of turbine-engine is likely to increase the safety factor. The ability to install more power plants of lower weight per unit is likely to give greater safety as would also the use of paraffin instead of petrol. In fact, it is believed by many that the introduction of kerosene fuels in the turbine-engined aircraft would yield one of the biggest single improvements in safety. The problem of safety has been subjected to a continuous study by I.C.A.O. which may be able to make a greater contribution in the technical sphere for promoting safety of air navigation. As the result of standards laid down by I.C.A.O. the requirements for safety have become increasingly severe and call for highest standards

in the maintenance of equipment. Indian airlines, therefore, put their pilots through an intensive and continuous training.

The causes of accidents to scheduled operators are varied. Accidents which have a single cause are rare and they are largely the result of combination of several unfavourable conditions. Personnel errors resulting from inadequate training, inefficient technique, operational mis-judgement or crew fatigue may contribute to accidents or damage to the aircraft. The standard of fitness maintained by a pilot has a direct relation to his operating efficiency and this becomes more important during the critical period of a flight as in making an operational decision or effecting a landing or take-off under difficult conditions.[5] Similarly failure of power-plant, structural failures, inadequacy of navigational aids, bad weather, defective airports and inadequately lighted runways may cause severe damage to the aircraft or result in passenger fatalities. Most of the accidents, however, occur during an approach to landing or take-offs when critical conditions can more readily occur either through human or mechanical failures.

It appears that the expansion of air transport industry has been accompanied by a continuous improvement in safety record of scheduled airlines. In air transportation, number of passenger fatalities per 100 million passenger-miles travelled is normally used to measure safety standard. The average traveller is not likely to appreciate this yardstick and a better one would be measuring flying safety on the basis of fatalities per hour or mile flown or per thousand hours or miles flown.[6] It appears on the basis of available reports that the overall passenger fatality rate due to accidents on scheduled airlines throughout the world in 1950 was 1.6 fatalities per 100,000,000 passenger-kilometers performed. It decidedly shows a progressive improvement

[5] Bergin K. G.: The Physiological Aspect of Air Safety, *J. R. Aero. S.*, October, 1949. p. 937.

[6] Lloyd Wilson G. and Bryan A. L. — Air *Transportation*, Ch. XXIII p. 435.

in the general world standard of safety on regular services to a present level about eight times higher than that of twenty years ago.[7]

The safety record of Indian airlines has been satisfactory. The safety record of external airlines, is even more remarkable in view of long distance of their routes. Passenger fatalities for each hundred million passenger miles flown by the Indian airlines on scheduled services during the years 1948-51 were as follows.

Year	Passenger fatality for each hundred million passenger-miles.
1948	No passenger fatality
1949	5.57
1950	18.73
1951	6.12

There has been no passenger fatality on scheduled international services during the years 1948-51.

THE REGULATION OF SAFETY

In India, the Indian Aircraft Rules of 1937 as amended from time to time have laid down regulations governing all the safety aspects of the scheduled and non-scheduled services. The safety regulations include licensing of the pilot, certification of the aircraft or air-worthiness requirements, enforcement of air traffic regulations, inspection of navigation aids and investigation of accidents. The D.G.C.A. who is charged with the duty of enforcing these regulations is also empowered to order the Inspector of Accidents to investigate any accident and to report his findings. The Government of India are also empowered under the rules to appoint a competent person to work as a "court" to hold investigation into the accident. The Government may also appoint one or more persons to act as assessors to assist the Court. The Court is required to make a report to

[7] Dr. Edward Warner: *J. Aero. S. of India*, Vol. I, No. 2, August, 1949, p. 10.

the Central Government stating its findings as to the causes of the accident, adding any recommendations with a view to the preservation of life and the avoidance of similar accidents in the future.

REGULARITY

Regularity of operation and safety may be said to have inverse relationship in air transport. As a vehicle of transport, the aircraft has still to establish dependibility comparable with a railway train, a steamship or an automobile. Though excellent flying conditions are available in India for at least eight months of the year, conditions for flying are less favourable in high latitude countries of the temperate regions where low visibility of ceiling at take-off points or destination, or icing conditions in the air may compel cancellation of the scheduled trips. Monsoons, unfavourable airport conditions and mechanical failures may also cause irregularities in the operation of the scheduled trips. Cancellations or long postponements are irritating to the passengers and also very inconvenient to the management. Unless travellers are certain that they can depart and arrive on schedules, they would not be tempted to travel by air. If air travel is to be accepted as a standard form of transportation, it must secure regularity of operation. Recent advances in bad weather landing aids, in traffic control and approach systems, and in maintenance of airports have given hopes that all-weather flying may be possible in the near future. Besides inconvenience to the travellers, cancelled flights cause serious in-roads into the costs of the airline operator. Additional expenditure is involved in case of a cancelled flight in transporting the passengers to the alternative transport-services or in accommodating them in a hotel if cancellation has occurred at an intermediate point. All expenditure incurred for such purposes represents an indirect cost to the operator. Indian airlines have been able to maintain an excellent record of punctuality, regularity and safety which makes one feel proud of the men employed in flying today. The skill and the clock-like regularity

maintained by Indian pilots have also received tributes from the operators of foreign airlines.

TABLE 1

Percentage of Regularity — Indian Airlines

1948	99.15%
1949	97.2 %
1950	85.62%

COMFORTS

The standard of comfort provided for the passengers and the crew has progressively increased with the increase in the size of the aircraft. The patrons of air travel value convenience and comfort besides speed, safety, and regularity. While the rail-road carriers have been offering convenience, economy and dependability, air carriers have been excelling these older forms of transport in speed. With the growth of airline traffic and the introduction of larger four-engined aircraft, airlines have been now offering increasing comfort facilities through air-conditioning, streamlining, reclining seats, sleeping and dining arrangements. Every advance in comfort facilities and every decline in rates have increased the demand for service.[8] But, any further increase in the comfort standard may result in sacrifice of the payload as the percentage of the gross capacity which is available for payload is strictly limited for each aircraft.

The effect of the provision of comforts may be illustrated with reference to old Ford transport aircraft which had only 25 pounds of furnishings and safety equipment for passengers. The modern aircraft contain more than 200 pounds of furnishings per passenger with 15-20 pounds safety equipment. Modern four-engined

[8] Increased space, interior design, noise prevention, improved ventilation, heating and lighting arrangements all of which contribute to the passenger comfort have enhanced the competitive position of air transport.

airliners offer more space, cock-tail bars, reading and writing facilities which are most valued on long distance routes. The average trip in domestic services is not long even in large countries like India, being less than 500 miles and the standard of comfort need not be so luxurious. Though the future promises still greater improvements, these may be accompanied by economic penalties. Improved service to the passengers involves sacrifice of payload. Beyond a certain standard any increase in comfort facilities will result in increased costs and increased rates. The basic objective in passenger transport is, however, to provide maximum comforts without increasing costs more than in proportion to the added revenue to be obtained from the increased business.

Inspite of the continuous progress in speed and comfort in air transportation certain factors have been deterrents to air travel. Fear of death in the airliner crash is still a great deterrent to many passengers. Cancelled flights, late arrivals or departures of scheduled flights, the necessity for advance reservation, high charges for excess baggage beyond a limited weight, air sickness and other discomforts, and time lost on the ground travel have been important drawbacks of the air travel. In order to keep ahead, the airlines have been continuously battling against these forces. After the World War II, the psychology of the travelling public has also greatly changed and the Indian travellers have gained complete confidence in air transportation. By their good service, personal attention, sense of hospitality and salesmanship, Indian airlines have created a new traffic and have been ever eager to overcome the factors that may discourage air travel.

CHAPTER II

PROBLEMS OF THE AIRLINE OPERATOR

Every operator who wants to organise an airline has to determine the route system he intends to operate, the traffic he expects to carry and the aircraft fleet which would give best results for the route planned and the expected traffic. A study of the potential traffic over the route planned is, therefore, a basic factor in the successful organisation of the airline business. In the post-war years a few airlines in India took the transport market for their services as granted and developed their organisation on the assumption that the production of services would be absorbed in due course of time. The expectations of these airlines did not materialise with the result that they had to go out of business within a very short time. A correct evaluation of the need for a particular service, accurate measurement of effective demand for it and correct pricing as measured by cost are, therefore, essential for success and efficiency of the airline management.

For successful operation of the airline business, adequate traffic potential is, therefore, the basic essential. This applies equally both to the individual routes, and to the overall operations of a particular company. It is a common experience for the airline operators that while some of the routes are not paying in the initial stage, others are sufficiently remunerative. In the case of a virgin route, the determination of the traffic potential with any degree of certainty becomes, however, a difficult task. Among the known sources to which the operator can turn his attention are the following:—

(1) AMOUNT OF POPULATION

The volume of air traffic will ultimately depend upon the size of the population and its stage of economic development. A country with a predominantly in-

dustrial population has a better traffic potential. Industrialists and businessmen are the best prospects for air travel as their expenses are ultimately paid by the business itself. Density of prospective travellers is, therefore, more important than the amount of population.

(2) *GROUND TRANSPORT SERVICES*

The traffic carried by surface carriers like railways, bus companies and in the case of over-seas travel by shipping companies serves as a useful source of information. In making use of this data, due allowance has also to be made to the new traffic that air transport would be able to create for itself. Ultimately, the choice of the traveller will be greatly influenced by relative rates and quality of service offered by competitive carriers. The value of service to the traveller is dependent upon such factors as safety, frequency, comfort, cost and speed. The relative position of the airlines is strongest in speed. In the over-seas market, air transport has become highly competitive to ocean transport on account of the technological developments which have taken place since the World War II. It is not, however, easier to measure broad movements of this type of traffic. Pleasure and business travellers value quality of equipment, comfort facilities, times of schedules and the fares charged. This group of travellers is stimulated by special rates, special allowances for families and baggages and round-trip fare reductions.

(3) DISTANCE BETWEEN CITIES

Other things being equal, the amount of air travel is normally dependent on population and inter-city distance, number of passengers by air being roughly proportional to the product of the two populations connected and inversely proportional to the distance between them at least for distances of 200 miles or more.[1] It is an usual

[1] Warner E. P. — Postwar Transport Aircraft. *J. R. Aero. S.*, July 1943 p. 193.

experience that large cities generally provide more short- and long-haul traffic per capita than do small cities. For these reasons, an airline route with highest number of cities is likely to have the highest density of traffic, and highest average load factor. Both these factors go a long way in lowering the cost of providing air transport per available ton-mile. The advantages of air transport over surface agencies, no doubt, increase over longer distances, but even on short-haul stages between two major cities having community of interest, the traffic potential would be substantially high. Thus, route, more than any other factor explains the profit or loss characteristics of the airlines business. The average length of journeys on the domestic airlines in India is about 425 miles and as the distance decreases below 200 miles, the amount of traffic potential falls off very sharply. If the average journey is longer, more miles are available over which the airline can spread the terminal costs. It is, therefore, found that longer the average journey, the more remunerative is the passenger's trip to the airline as station costs are the same for long and short-haul passengers.

LEVEL OF NATIONAL INCOME

In the pre-war years, mail rather than passenger traffic dominated the airline services in India. It was only during and after the war that there was an upward trend in the passenger traffic. Even then for the size of the country the amount of passenger traffic that was carried was very small. In 1951, Indian airlines carried 449,462 passengers which only indicate the low traffic potential for air services in India. The market for air services is very limited on account of the general economic conditions in the country. The figures of income-tax assesses of those who have travelled first on Indian railways also indicate the low traffic potential. The latest available income-tax statistics for India relate to the year 1948-49 and give the frequency of distribution of individual assessments as below:—

TABLE 2

Income Group Rs.	Salaries	Individuals deriving income from		Total
		Salaries and others sources	All other sources	
3,501 - 5,000	32,519	8,897	29,298	70,714
5,001 - 7,500	26,103	7,660	25,358	59,121
7,501 - 10,000	14,688	4,335	14,381	33,404
10,000 & over	21,662	10,613	36,876	69,151

If it is assumed that people having an income of Rs. 5,001 and over per year are likely to travel by air, the total number of such individuals is of the order of 161,676 persons. Some addition will have to be made for the persons whose large income is derived from agricultural sources. Even then, the total number of persons who are likely to travel by air is very limited. The statistics of persons who travel by first class on Indian railways also confirm this conclusion. In 1948-49, the number of first class passengers was about 5,073,500 out of which as many as 3,787,677 were suburban passengers travelling in first class. This leaves a total number of first class passengers of 1,285,823. Some more traffic, no doubt, could be attracted from the first class passengers but the scope for such a diversion is not very large. Potential air traffic in India will have, therefore, to be related to the development of trade and new industries.

STATISTICAL UNITS IN AIR TRANSPORT

In order to measure the probable costs and revenues, the operator can use various statistical units. The chief ones are described below:—

(1) *Aircraft-miles flown:* These include miles flown on regular schedules as well as those required for non-revenue purposes such as test flights and crew training. These revenue and non-revenue aircraft miles have to be considered in measuring the total aircraft-mile costs. The cost per aircraft-mile can be gauged by dividing the the total cost of operation by the total miles flown.

(2) *Revenue-miles* flown means the number of miles flown by an aircraft carrying passengers, freight and mail for pay. Passenger seat miles flown, therefore, represent the passenger carrying capacity of the aircraft operated.

(3) *A passenger-mile* in air transport means one passenger carried one mile. In its plural, the term passenger-miles measure the miles flown per each inter-station trip multiplied by number of passengers carried on that trip.

(4) *A ton-mile measure* is, however, more convenient since the same aircraft may carry passengers, mail and freight. A ton-mile means one ton carried one mile. The total cost of operation divided by the total ton-miles gives cost per ton-mile performed. Capacity ton-miles of transportation available for the carriage of passengers, freight and mail serves however, as a better yardstick for an overall comparison between various operators. Since capacity ton-miles represents the total production of the airline services as actually operated, it is a good datum against which the costs can be measured. Capacity ton-miles is thus the measurement of the number of tons of weights available for revenue use multiplied by the number of miles this available weight is carried.

(5) *The Operating Ratio:* The expense per aircraft mile flown to revenue per aircraft mile yields the operating ratio. It is a good measure of the efficiency and inefficiency for commercial operations.

(6) *Revenue Passenger Load Factor:* The load factor refers to the percentage of revenue utilisation of the available ton-miles which will just cover the actual expenses of operation. In air transport, load factor refers to the ratio of the number of seat-miles occupied by revenue passengers to the number of seat-miles flown. Load factor thus suggests the ratio of the average use to the maximum use, or the degree to which the capacity offered is utilised. In air transportation, the load factor is usually calculated on a monthly or annual basis. The break-even load factor for the airlines varies with circumstances. A load factor at about 65 per cent is considered satisfactory. If the operator is running a stop-

ping service, he has to provide accommodation to the short-haul passengers on his route and at about 65 per cent load factor, he may have to turn away the passengers. If there is enough traffic, the operator may run a non-stop service at a higher load factor and a stopping service at a lower load factor and the average of the two load factors may give him satisfactory results. If, however, the cost of operation increases and the operator is unwilling to increase the existing standard of rates charged by him, he has to try to attain a higher load factor to break even. The level of passenger, mail and freight rates will, therefore, affect the break-even points.

Though an airline can operate economically with a load factor at about 65 per cent, this economic load factor is relatively high as compared with other forms of transport which incidentally explains the need for reservation system for the operation of air services.

SURVEYING A ROUTE

An analysis of traffic generating possibilities of the various routes is thus necessary to decide the adequacy of the routes. The routes must be adequate both from the standpoint of volume and density of traffic. An airline route with highest number of traffic-producing cities is likely to have highest density of traffic and highest average load factor. The structure and adequacy of the routes is, therefore, one of the most important factors that leads to success or failure of airline business. In his choice of the routes, the operator would prefer a route which would secure financial autonomy for the carrier and would also possess adequate airway facilities including intermediate and alternate airports to provide safe operation. In planning external routes, the operator's choice would be determined by the interplay of geographic-economic factors which include flying weather, longest unavoidable non-stop flights, potential traffic between terminals and along the route, travelling habits and availability of adequate navigation and fuel facilities. Once the routes have been planned and their traffic potential assessed, the operator has to un-

dertake survey flights to solve the operational problems. Very often a ground survey is also essential even before the first survey flight is made. When the operations are started, the success of the operator depends to a large degree upon his initiative and perseverance in converting the potential market into actual traffic. It takes considerable time to develop a route by creating good-will and reputation and the operator has to approach the potential patrons of air services through advertising and in case of freight by personal contacts with commercial houses.

After the route has been surveyed, the operator has to organise the route before actual operations are commenced. At each airport, a station office entrusted with the booking arrangements and sales promotion has to be provided. This branch office also attends to the meals for the passengers *en-route* and ground transport from the airport to the city-centre. Facilities have also to be provided for the servicing at the airport *en-route* and for the fuel supply. All these arrangements must be made in advance.

SELECTION OF THE AIRCRAFT

The survey of the route should enable the operator to select the aircraft which would obtain optimum adjustment with the route characteristics. The operator has also to take into consideration other factors like the volume of passengers and freight that he would have to carry, the frequency of operations, preferences of the patrons of air transport in matters of speed and comfort, the weather likely to be met, the range to be covered and the ground and route organisation. The estimated traffic over the network of routes to be operated will govern the size of the operator's fleet which will meet the schedules planned. Inadequate number of aircraft may lead to neglect of maintenance. The operational reserve must, therefore, be proportionate to the schedules planned. The reserve must not be too large as it means heavy capital expenditure. The narrow margin between possibilities of profit and loss thus compels the

operator to keep a minimum reserve. When the operator purchases a fleet of aircraft, he has also to purchase spare engines and spare parts in adequate numbers for overhaul and maintenance and for their distribution at points along the routes of the airline. This additional expenditure increases the cost of the new aircraft-fleet by about 25 p.c. A certain allowance has also to be made for the purchase of ground equipment required for servicing and maintaining of the aircraft during periods for maintenance. Before a fleet of aircraft is purchased, the operator has to work out the specific work that the fleet will have to do and the quantum of traffic expected and the peak period requirements. Any error of judgement about the amount of traffic that may be available is likely to affect utilisation one way or another. Aircraft utilisation has also an important bearing on the operating costs and particularly on such factors as depreciation and insurance. The operator has, therefore, to plan maximum milage from each aircraft per year as it may help him to reduce the overhead costs in relation to the ton-mile flown.

Payload, fuel consumption and speed are the most important characteristics of the aircraft as affecting operating economics. Payload would depend largely upon the size of the aircraft and its fuel requirements for a certain range of operation. The operator may select a small or a medium-sized aircraft permitting greater frequency or may select a larger aircraft and sacrifice frequency. A larger aircraft may prove to be more economical if the operations have to be carried on a high density route. But such an aircraft may not suit the traffic requirements if a higher frequency is desired. A medium sized aircraft may, therefore, prove to be more economical for a given traffic potential. The operator has, thus, to weigh greater frequency with medium or samll sized aircraft or low frequency with a high density aircraft in the same manner as he would weigh between speed and comfort or low costs and low rates as overriding factors in his selection. If the operator manages to possess a standard fleet, it should enable him planning of operations less complex and costly. It may also

eliminate the need for multiple training of air and ground crews or for holding of a large assortment of spares both at bases and along the routes. To a certain extent, a standard fleet does operate in India since the main operating fleet of the different airlines comprises Dakota aircraft, nearly all being military conversions.

The operator has also to consider capital cost of his fleet. Capital investment in a commercial aircraft is much higher as compared with other landbound transport vehicles. (This is particularly so in the sphere of international operations, where operators are compelled at heavy cost to re-equip themselves with new aircraft at brief intervals owing to technological progress and severe competition.) This may be attributed to larger motive force required per unit of load carried and to the high quantity of material required for the aircraft. The technical efficiency of the aircraft is, therefore, determined by the capital investment in flying equipment in relation to its payload capacity. The main consideration with the operator is the first cost per paying seat or per unit of payload. The present day capital cost per pound of complete but unladen weight of transport aircraft is between pounds 3 to pounds 5. it varies very nearly directly as the all-upweight of the aircraft. The present day capital cost per pound of complete but unladen weight of varying transport vehicles is as follows:-

Type of vehicle.	Cost per pound weight complete but unladen.
(1) Transport aircraft pressurised	£ 3 to £ 5
(2) Double-Decker bus	£ 3 to £ 6
(3) Ocean-going liner (12,000 to 30,000 tons replacement)	9d. to 11d.

The high capital of the modern aircraft may be attributed to its technical efficiency. The post-war aircraft is more superior in aerodynamic efficiency, has greater speed, proportionately lower fuel consumption and a larger size which permits it to carry a larger payload. A new aircraft, however, involves very large

development cost, as the aircraft have now become more complicated. Thus in the case of Consolidated-Vultee Convair-Liner, a 40 seater airliner, development cost of 11 to 13 million dollars has been incurred. This estimate includes design, mock-up, building the prototype and tooling for production. In addition, an inventory of materials and work in progress amounts to a further 30 to 32 million dollars. This adds up to a total expenditure of 41 to 45 million dollars before starting deliveries. This high cost associated with the development of new models is largely due to the time and engineering expenses. On an average, about two to four years are required to translate a research design into an experimental aircraft. Another period of the same magnitude is further required in manufacturing tools for the first prototype and for testing it over a prolonged period. The development expenditure never comes to an end so long as the model is giving useful service and is demanded by the operating airlines. This is quite in contrast to the manufacturing conditions which prevailed twenty-five years ago when a few engineers could design and construct a prototype within a year.

The operator is not so much concerned with capital cost as with its relation to the payload. But the payload and fuel are interrelated. For every aircraft, the maximum permissible gross weight for take off is prescribed at a fixed figure. This is determined on safety grounds in accordance with current airworthiness and emergency performance reqirements fixed by the licensing authorities. In the case of every aircraft, a large part of the power is needed to lift the aircraft and secondly to propel it. As the result of this situation, larger power is needed in lifting an aircraft with a large initial gross weight at take off. Besides its own empty weight, every aircraft must carry fuel, oil, crew and essential supplies. The residual load would be, therefore, the revenue load. Since fuel and oil load depend upon the power required for take off and cruising as also upon the stage length, the payload would depend upon the fuel requirements. In the case of DC.3, which is largely used by the Indian airlines for passenger service, the all-up weight under

civil requirements is restricted to 26,200 lbs. The basic operating weight of the DC.3 ready to receive fuel and payload is however only 18,850. But the weight-limited payload appropriate to a given stage distance does not necessarily represent a load which it is possible to carry in practice. Space or volumetric limitations of the interior layout of the aircraft very often impose a certain restriction. The average payload of a 21 seater Dakota on the basis of average stage lengths of flight in India is 5,450 lbs. Of this 21 passengers take about 3,276 lbs. 924 lbs. for passengers baggage, leaving 1,250 lbs. for mail and freight. The difference between the maximum permissible weight fixed for take off and the basic operating weight of the aircraft plus the fuel for desired operation, thus constitutes the margin available for passengers and freight. Since the amount of fuel that the aircraft carries reduces the payload, every airline tries to keep the operating weight of the aircraft to the minimum necessary. As previously indicated, the payload is dependent upon the fuel load which in its turn is dependent upon the stage length. For every aircraft, there is therefore an optimum stage distance at which maximum economies can be secured by carrying highest amount of payload with minimum amount of fuel, obtaining thereby minimum cost of operation per ton-mile. The average length of Dakota flight under the existing route pattern in India is of the order of 270 miles. Viking and S.O. 95 have stage lengths of 650 miles and 263 miles respectively. Every stage length requires a certain amount of fuel including an allowance for contingencies such as excessive head winds or for deviation to an alternative airport. On occasions, the aircrew have to be provided more fuel than the standard sector fuel on account of bad weather and this necessitates off-landing of a few passengers, freight or baggage. If the aircraft is operated beyond the optimum stage length, it will have to carry more fuel which means reduction in the payload. An aircraft is thus a poor weight carrier as compared with other vehicles. Its weight limited payload appropriate to a given stage is also limited by the fact that the operating personnel has a

high proportion to the number of passengers and cargo capacity as compared with other vehicles. As the payload capacity of every aircraft is thus fixed on account of the gross weight limitations, judicious pre-planning of the available payload is necessary so that all available space is sold out.

If once consideration is given to these factors, it may become possible for the operator to work out the best speed for his operations. The speed which is of significance is the average attained from departure point to arrival at the unloading point at the destination. This is known as the "block" speed. This speed drops sharply as the stage distance is reduced since there is always about the same amount of time taken in taxying out, running up the engines, the take off run itself and landing and taxying in. This time is not productive and the shorter the direct flight time, greater is the influence of this fixed and unavoidable time-interval in reducing the average speed. Since high speed involves higher cost, the operator has to work out the best economic speed for a given stage length and the amount of the payload to be carried.

If the operator has worked out the best speed for a properly selected aircraft, having optimum co-relation with the route characteristics, the operator should be able to find out the cost of operation and the needed revenue to break-even. The cost of operation of each service is measured by applying the cost per mile of the total operation to the milage flown on each service or route. If the cost of operating a route is greater than the expected income, commercial operations would become impossible unless a subsidy is available. When an operator selects his aircraft, he generally bases his calculations on the figures supplied by the manufacturer. In the case of a new aircraft, the manufacturer's data very often proves to be overoptimistic and misleading as the aircraft has usually to undergo mechanical and structural teething troubles in the initial years. This necessitates modifications, aerodynamic and structural changes, all of which involve additional expenditure. This has happened to a certain aircraft used by an Indian

airline. If the operator selects his aircraft with known performance, he is not likely to run this risk.

BASIC AIRCRAFT TYPES

In the early years of civil aviation, the aircraft used for commercial transport was converted from bombers. It was mostly a single-engined aircraft having a slow speed. Between 1920 and 1930, larger twin-engined aircraft were introduced, most suited to short-haul operations. On the eve of World War II, there were nearly 32 models in the market. From the end of 1930 to the end of 1939, some standardisation in the basic aircraft type was visible and by 1936, DC.3 came to be widely adopted in the United States. For the first time this aircraft answered to the airlines' prayers and gave them a bigger and economical aircraft. [2]

In the early years of civil aviation, aircraft manufacturers usually produced for specific contract, concentrating more on the aerodynamic properties of the aircraft with only limited attention to problems of economic operation. Just before 1939, the aircraft industry had adapted itself to new technology and had made very big strides in range and carrying capacity of the transport aircraft. During the period associated with World War II new models were put into operation. These were larger, faster and capable of longer flights at great heights as compared with pre-war models. Though superior in performance, the post-war aircraft types have not however shown any substantial reduction in the unit cost of operation as had been expected. The post-war aircraft has proved to be a difficult type because of the heavy increase of work necessary on the increasing technical gear to be serviced. Though the increased size of the aircraft has permitted a larger payload and an increased range any further quest for larger range and increase in size is not likely to promise any further

[2] Even in India, standardisation to a limited extent has resulted as most of the domestic airlines are operating with a fleet of DC.3s and Vickers Vikings aircraft.

economic advantage. In fact, the first cost has shown a tendency to rise rapidly than the size.

Air routes over a large part of the world are now operated by more or less standard types of aircraft varying in size and performance according to the needs of the routes. For short to medium-haul stage lengths several standard types are available. Dakota, Martin 202, Convair 240, Vickers Armstrongs Viking and Viscount, De Havilland Dove and Airspeed Ambassador have proved to be very economical for medium-haul operations. Out of these Dakota has been widely used all over the world and is best suited for 300 to 500 miles range. Prior to 1939 however this aircraft was used by the airlines whether the journey was 200 or 2,000 miles in length.

Multi-engined aircraft are now used for long-haul operations. DC.4 or Skymaster was introduced even before the World War II as a transitional type and has proved to be quite efficient both for moderate-haul and trans-continental routes. Other basic types operating on the international and inter-continental routes are Avro York, Handley Page, Hermes, DC.6, Boeing Strato Cruiser and Lockheed Constellation. These aircraft have been designed with all types of interiors from luxury sleepers to high density planes and are eminently suitable for specialised services. These multi-engined aircraft have proved to be more economical because of their lower fuel consumption and higher capacity to carry payload. Many of them have pressurised cabins, can operate at higher altitudes and have a range exceeding 2,500 miles. The cost of operation of these modern aircraft is, however, very sensitive to the degree of utilisation achieved and unless high utilisation is obtained, their operation would prove to be uneconomical. This means that these high density aircraft can be operated only when traffic potential is high. There is, however, some economic uncertainty in the use of too large aircraft units as the benefits of the size at any given range increases much more slowly as the size of the aircraft is enlarged. It has been a common experience of the operators that the first cost increases very rapidly with

the size and sometimes is out of proportion to the capacity payload. Size thus affects the cost of the aircraft more than any other type of vehicle. The aircraft should, therefore, be no larger in size than is required to accommodate the range, standard of passenger comfort and a satisfactory load factor. The increased size of the post-war transport aircraft with its increased sitting capacity and increased speed which enables the aircraft to produce a larger number of transportation miles in a short time has one significant effect on the size of the commercial fleet. A small size of fleet is now required to handle a given volume of traffic. The average number of seats for the aircraft has almost doubled in the post-war period and at the same time the average speed has increased approximately. On this account the average aircraft in the post-war period is able to produce over twice as many seat-miles per hour as the average aircraft in the pre-war period.[3] Thus with the introduction of equipment having greater speed and productivity which permits greater payload and utilisation, there has been a notable decline in the number of aircraft required for producing a given amount of seat-miles.

Turbo-prop aircraft with a cruising speed of 300 to 350 miles per hour and turbo-jet with a cruising speed at nearly 500 miles per hour will be shortly available. Even under the present operating conditions, they are economically competitive. A new era was ushered in by the Comet service between U.K. and India when the Jet airliner flew into Bombay on Tuesday the 12th August, 1952 carrying the first compliment of passengers from the U.K. The scheduled journey time for this class of service is about 14 hours and 20 minutes including one hour stops at each of the four places of call. Piston engined aircraft flying over the same route takes about 23 hours to complete the journey. Comet III which is likely to be put into operation in the near future is an improvement of the present aircraft and will have a longer flight range, larger fuel storage capacity and a better passenger accommodation. Though the jet air

[3] Gill and Bates — Airline Completion, op. cit. p. 175.

services will be the fastest, their introduction on world air routes will take a longer time. These aircraft, particularly the pure jet type and to a lesser degree the propeller turbine type use a far greater quantity of fuel than do the conventional piston engined aircraft of the same capacity. In view of the fact that fuel is very costly in India and secondly the traffic potential is very low with the existing set of circumstances, the introduction of jet aircraft is not likely to be profitable for the present. In fact, air transport industry all over the world is now passing through a period of transition from piston-engined to gas turbine driven aircraft and India will have to wait for some years to allow new types to become stabilised. The capital cost of the new types is also very high and so is the incidence per hour of depreciation and insurance charges which will have to be spread over a larger number of hours per annum. Economic results from these types cannot be secured unless these types are worked at the rate of 3000 hours per annum. It is hardly likely that this standard can be attained in India in the present conditions. Faster and modern economical aircraft like Comet and Super-Constellation will have to be operated on the international routes in the next five years. On domestic routes Dakota and Vikings will give place to Vickers Viscount, Airspeed Ambassador (British), Martin 404 and Convair[4] 240. The Indian airlines have now a fleet of 115 aircraft.

[4] The Viscount produced by Vickers-Armstrongs and driven by four turbo-propellers will have a cruising speed of 300 to 350 miles per hour and will accommodate 40-44 passengers. De Havilland Comet—the first pure jet airliner with a cruising speed of 500 miles an hour can accommodate about 36 passengers. The speed given by Comet is nearly 70 per cent greater than comparable piston-engined machines. It is basically safer because it uses paraffin as a fuel instead of petrol. Both Comet and Viscount are more productive as compared with piston-engined machines since they can carry a unit payload at a lower cost. Comet is said to be 20 per cent cheaper to run per capacity-ton mile. Though the gas-turbined engine aircraft appears to be more expensive

With the adoption of new and larger types, there may be reduction in the number of aircraft in use despite continuous increase in traffic. This may result from the introduction of larger and advanced type of equipment having greater speed and capacity and improved operating technique permitting higher payload. A small-sized fleet would be, therefore, required. The new aircraft may, however, require intensive operation. The days of Dakotas and Vikings are likely to be over within the next five years. The Indian travelling public is progressively becoming more and more discerning in selecting the aircraft in which it flies and more and more appreciative of the standard of service that is provided.

A word may be said about flying boat services. Even before the World War I Short Empire flying boat services were operated by the Imperial Airways, Ltd. on certain overseas routes of the British Empire. British Overseas Airways Corporation successors to the Imperial Airways later on introduced Solent flying boats. U.S.A. was also running the Boeing 314 flying boats services for commercial operations between 1939 and 1946. Short Sandringham flying boats built by Short Bros. are also now being operated by Tasmania Empire Airways on the Australian-New-Zealand Route. A few flying boats are similarly being used in South America. With the introduction of 'Princess', another landmark will be shortly witnessed in British aviation. B.O.A.C. is particularly interested in the commercial application of this flying boat. The 'Princess' is a 140-ton transport aircraft and made its first flight in 1952 and can carry 120 passengers or 200 fully equipped troops over very long ranges. The flying boats in general offer certain advantages to the prospective operator. These types can carry

in the first cost, it has greater speed and the quicker turnround time may give it higher utilisation. The development flights undertaken by these two aircraft indicate that stages of 1,000 to 2,000 miles would suit the specialised jet airliner and stages of 250 to 1,000 miles for the turbo-prop airliner. It has been estimated that on medium ranges the Viscount may give good operating flexibility.

a larger payload, are more spacious and offer a high degree of comfort. The water-dromes required by these boats are inexpensive for up-keep and offer unlimited runway with few obstructions. On the other hand, land-planes require runways which have to be larger, longer, thicker and strongest with every increase in their size, not only at the termini, but also at all emergency and alternative aerodromes. Flying boats have also shown a better accident survival record. The indirect operating costs of these boats are, however, very high. Technically and from the viewpoint of passenger psychology, flying boats have potential advantages which deserve a close study. Whether the flying boat will have a place in the future pattern of international transport is still problematic. Apart from economic considerations, much depends upon the attitude of international operators. At least for the present, except B.O.A.C. no major carrier has shown any interest in the flying boat. In the U.K. the future of the flying boat has been considered as a national issue with important military and strategic aspect.

The land-planes have, on the other hand, proved their superiority over flying boats and as they lend themselves to higher altitudes and pressurisation. Both for speed and comfort, landplanes are preferred by patrons of air travel. Land-planes have also proved more adaptable for use on routes combining over-land and over-seas flying operations. Since the land-planes are more dominant today on international and domestic routes, they have naturally received more attention from the aircraft manufacturing industry.

UTILISATION OF THE AIRCRAFT

Having determined the routes, the character of the equipment and the best economic speed, the operator has to estimate traffic available and the minimum practicable cost including a reasonable return on his investment. To a large extent, cost considerations would be influenced by the estimated utilisation of the operator's fleet including the need for the operational reserve which

would depend upon the magnitude of operations. Utilisation is defined as the average number of hours flown in a year by any one aircraft in a fleet, i.e.

$$\text{Utilisation} = \frac{\text{Fleet revenue hours per annum}}{\text{Number of aircraft in fleet}}$$

The revenue hours extend from take off to touch down, but positioning flying and other non-revenue flying time is not included.

Since capital investment in aircraft is high and has a short life, intense utilisation of the aircraft is necessary so as to reduce unit costs and lower the level of fares. But increased utilisation of the aircraft does not indicate successful airline business as it is related to the passenger load factor. A proper balance between aircraft utilisation and load factor has to be maintained as both have a bearing on the operating costs per ton-mile. On the other hand, an idle aircraft is an overhead expense. High utilisation is thus synonymous with high operational efficiency. Maximum possible efficiency and utilisation of both equipment and flight personnel can be achieved by careful planning of flight operations. This is the responsibility of the Operational Department which must try to improve the scheduling movement of individual aircraft and flight crew so as to achieve desired intensity of scheduled services which may satisfy traffic demands of all stations along the line. If schedules are pre-planned in a careful manner, they can be so interwoven that all the traffic available is served in the most economic manner. The aircraft provided as a reserved coverage need not be kept idle. If the schedules for the aircraft fleet are so arranged that one aircraft is always available for emergency, the policy of maximum utilisation can be reconciled with the need to keep a reserved coverage. The manner in which potential trips are planned and the degree of regularity with which they are maintained would go a long way in governing the route utilisation. Usually, revenue utilisation would depend upon the type of work to be done, structure of routes and stage lengths, frequency of service, route facilities for day and night

flying, seasonal fluctuations in traffic and maintenance and overhaul practices. It would also depend to a certain extent upon the freedom which the operator has to develop operational routing plans for the airline network as a whole. Careful attention to the problems of operational planning should therefore enable the operator to raise average utilisation to a desired level.

An airline with high degree of frequency, flying both day and night has, therefore, a good opportunity to achieve high revenue utilisation and high unit of efficiency. If the airline has a fleet of standard type of aircraft, it may have reasonably good chances of achieving high degree of utilisation. The following table illustrating the average utilisation rate per annum of three dfferent transport vehicles is interesting in this context.[5]

TABLE 3

Type of Vehicle.	Present average utilisation rate p.a. in hours.	Chief reason for limitation of utilisation rate.	Average working life.
Transport Aircraft	1,460 to 2,920	Service Engineering.	5 to 7 yrs.
Bue	5,110 to 5,840	Lack of traffic offering during night hours.	7 to 12 yrs.
Ocean Liners	6,570 to 7,300	Loading and unloading facilities.	Upto 35 yrs.

Since a transport aircraft as compared with an ocean liner has a very short revenue earning life, high utilisation per annum is necessary. In the case of bus and ocean liners, their utilisation is limited by reasons out of

[5] *J. R. Aero. S.*, Feb. 1949, p. 185.

the control of their operators. But in the case of a transport aircraft, servicing and maintenance are under the control of the operator to a large extent. Increased utilisation, therefore, depends upon the operator's efficiency. It is generally assumed that minimum average utilisation required for economic operation is 1500 hours per annum. Any lower utilisation than this may suggest that more aircraft are in use than the circumstances warrant. The average utilisation for Indian domestic airlines in recent years has been under 1000 hours while in countries like U.S.A. and Australia, utilisation exceeding 2500 hours has been quite normal. The low utilisation in India may be attributed to large purchase of aircraft without regard to actual needs of the airlines, inadequate overhaul and maintenance facilities and difficulties in getting critical spares. Air India International, however, achieved a record rate of annual utilisation of about 3000 hours per aircraft or about 8.1/4 hours per day in 1950.

The co-relation between utilisation and the costs can be demonstrated by the following estimates of the Air Transport Inquiry Committee for the operation of the Dakota, the Viking, the SO.95 at different utilisations on the Indian routes.[6]

TABLE 4

	Utilisation of 1000 hours. Rs. per hour.	Utilisation of 1500 hours. Rs. per hour.	Utilisation of 2000 hours. Rs. per hour.
Dakota	624.1	571.6	541.5
Viking	897.3	789.2	731.4
SO. 95	506.8	435.9	401.1
Skymaster	1513.1	1362.2	1282.4

PERSONNEL UTILISATION

Efficiency of airline operation also depends upon the right selection of the personnel such as pilots, ground-

[6] A.T.I.C. Report, p. 199.

engineers, dispatchers, maintenance-mechanics and others. The operator has also to keep the strength of trained personnel to the absolute minimum consistent with efficient working of the whole organisation. Likewise, he has to maintain a proper balance in the utilisation of the personnel and the available facilities. The operator has, therefore, to keep a continuous watch on the performance of the employees so as to obtain optimum productivity from each worker. The best guide for determining economic efficiency of the airline organisation is to calculate capacity ton-miles of transportation produced during each year as measured against the average total number of workers. If the strength of the personnel is proportional to the anticipated workload, the operator should be able to achieve best overall results. This is particularly so in the maintenance department. If maximum efficiency is secured in this department, staff employed for preventive inspection, overhaul of airframes, engines and accessories can reduce the maintenance time to the minimum so that aircraft is not grounded for a long time resulting in loss of revenue. Through the system of cost accounts and budgetary control should enable the operator to control expenditure and to keep a continuous watch against the increasing costs, efforts are needed to create cost-consciousness in the working personnel so as to obtain satisfactory results.

SHORT-HAUL OPERATIONS

Short-haul operations on the trunk routes involve special problems for the operator. On short-haul stages, airlines have to meet the competition of the surface transport agencies and in view of the low fares charged by ground services, air services tend to be high cost transportation. Trunk lines as distinguished from feeder or local lines operate over routes connecting the principal cities in the country. The chief function of an airline operating over such a route is to provide for the rapid movement of passengers, mail and freight between centres of large population. The principal distinction

between trunk-line and feeder line operations is that a large part of the traffic carried by trunk-line carriers is delivered to the terminal stations by feeder lines which pick up traffic originating from scattered centres of small population. A trunk route operator has therefore to maintain a large organisation. Consequently, trunk line carriers have different problems as against feeder airlines in respect of number of stops, size of equipment, capital investment and operating practice. Since trunk routes are planned to serve large cities, situated at large distance consideration for intermediate stations is a secondary consideration.

Over short-haul stages involving stops, an aircraft can carry a larger payload. As refuelling facilities are available at the intermediate points, capacity displaced by fuel can be sold for earning revenue. Aircraft for trunk-line operations have a larger size and can carry larger number of passengers, mail and freight. Convertibility from day plane to sleeper plane is also possible. Every aircraft has an optimum distance at which it can be operated most economically. Thus DC.3 has an economic range of approximately 500 miles. If any aircraft is used on a stage length appreciably beyond the optimum range for the type, there would be a drop in the payload with consequent rise in the specific costs. Every operator has to decide whether he would run a non-stop or a stopping service between the two terminals. If traffic warrants, he would prefer to run a non-stop service as the insertion of an intermediate stop means loss of time resulting in the reduction of the block-to-block average speed. In addition, a non-stop service has the advantage of running shorter mileage resulting in saving of petrol consumption and landing charges. There is also a saving of expenses for housing and lodging of the crew as the aircraft can run a return trip on a direct service on the same day. Consequently, the economic utilisation of the aircraft and staff is better on a direct route operated with a nonstop service. An average stop, even when there is no refuelling, costs an airline about 15 minutes and this time tends to become larger with the increase in the size of the aircraft and the stage

length. A portion of this loss is inherent in air operation and as fights are made at higher altitudes, it may even increase. On short-haul stages involving stops, direct operating costs are proportionably higher as the cost of taking off and climbing back again to cruising altitude and landing again is spread over a shorter distance. To these expenses, the cost of maintaining a station and ground organisation at the stopping places must be also added. Time, thus, lost on the ground for every departure and arrival is not productive of the distance travelled towards the destination and shorter the flight time, greater is the influence of the time interval on the cost of operation and on the average speed. How short-haul operations with stopping services involve higher operating expenses can be illustrated with reference to the services operated by Air Services of India in Saurashtra. These routes besides being short themselves involve a number of still shorter stages requiring maintenance of staff and facilities on much larger scale than would normally be necessary.

Often the operator has to make a stop at an intermediate point for refuelling without prospects of getting traffic or because he is compelled to make the stop under a mail contract. Such unprofitable stops become therefore a problem for trunk line carriers operating fast services.

The problem is also made complicated by another factor, namely, the distance between city centre and the airports. The time lost in transit from the city centre to and from airport may form a substantial part of the total journey time. Airline time tables usually give airport to airport time which may explain only the theoretical saving of time over the time required by surface transport agencies. It is a common experience that shorter the trip, greater is the percentage of time consumed by getting to and from the airport. This situation thus creates a minimum distance for an economically feasible air-trip. As the length of the air journey increases, this disadvantage is gradually overcome.

TABLE 5

Distance of some airports from cities in India.

City	Distance in miles.	City	Distance in miles.
Bombay-Santa Cruz	12	Kanpur	5
Calcutta-Dum Dum	10	Bangalore	6
Delhi-Palam	6	Ahmedabad	4
" -Safdarjang.	3	Allahabad-Bamrauli	8

Over short-haul routes, there is thus a minimum distance below which the advantages of the surface transport of one form or another would outweigh the advantages of flying.

If the terminal centres are not able to produce adequate traffic and if the intermediate centres are strong in traffic potential, a stopping service would be desirable. Ultimately, the traffic generating power of the transport-market in which the route is located will be the major factor in determining the character of the service. The operator therefore can profitably operate a non-stop service over a stage length if the terminal stations are strong in traffic potential. But, instead of flying 500 miles non-stop, the operator may also find it profitable to break the journey half way and refuel there. If the technical stop required for refuelling is also strong in traffic potential, it would be an ideal stop. If, however, the intermediate points are stronger in traffic potential in relation to the terminals, a stopping service would be more profitable. The number of scheduled flights on such a route would be dictated by volume of traffic and by the necessity for making connections with other trunk-line carriers. Such stops on trunk-routes are relatively few and are usually situated at respectable distance to permit the carrier to take the full advantage of the speed.

Whether the operator runs a non-stop or stopping service between two terminals with varying traffic potential, his judgement would be influenced by available

volume of traffic and by the size of the aircraft. The operator has, therefore, to decide whether it is better to run a smaller aircraft very frequently or a larger one at less frequent intervals. If there is sufficient traffic potential at the terminal stations and at the intermediate major cities, the operator may run one non-stop and another stopping service on the route, planning the schedules in such a way as to satisfy the demands of all stations on the route with ideal arrivals and departures. If frequency is sacrificed on such a route having adequate traffic, some of the advantages of air transport may be lost. For instance, if the number of passengers per week travelling between two cities total about 150 on the average either way, operating a 60 passenger aircraft thrice a week either way with an average load factor of nearly 85 per cent and at a cruising speed of 300 miles per hour over an average block distance of 300 miles may not be quite as desirable as operating a 30 passenger aircraft 7 times a week with a load factor of 70 per cent and at a cruising speed of 250 miles per hour assuming both aircraft to be aerodynamically of equal merit.

Though aircraft is primarily a vehicle for distance transport, short-haul services can be developed over routes where some extra-ordinary obstacle exists for surface transport. Similarly a good traffic can be developed between a city pair on a short-haul stage and having a high density market. Thus between London and Paris, the demand for air travel may fluctuate from day to day requiring high capacity for peak periods. Over such high density routes, frequency rather than speed is the dominating factor. Non-stop flights over short-haul high density routes are more desirable because of the relatively high proportion of overall time consumed by a stop. Non-stop operations over such routes permit the aircraft to reach the cruising altitude to achieve maximum efficiency and to secure economies associated with high degree of utilisation. If, however, the distance between the two terminals over a route is greater than the optimum for the operating aircraft, the rates to be charged to the passengers would be higher than

would be the case if the route was broken down into economic sections approximating to the optimum.

LONG-HAUL OPERATIONS

In the pre-war years, a 2,000 mile distance could be flown with very little commercial load. Since then, technical developments have reached a stage when long-haul flights could be made with payloads large enough to make these operations commercially successful. Long haul operations on over-seas and inter-continental routes though uneconomic in character have had been financed liberally through subsidies. Prior to war aircrafts like DC.3 were used by airlines for all journeys, whether the journey was 200 or 2,000 miles in length. Since then, aircraft larger in size and capable of flying at longer ranges have been made available for long-haul operations. Even before the war, plans were ready for the development of faster and larger aircrafts which could serve trans-continental market. On the eve of the war DC.4 or the 42-44 seater Skymaster at 239 m.p.h. was made available and provided the airlines for the first time with an equipment which could be used for long-haul operations. Lockhead Constellation equipped to carry 38-42 passengers having a range upto 3,500 miles and cruising at 267-322 m.p.h.; Douglas DC.6 having accommodation upto 52 passengers and a cruising speed of 269-325 m.p.h.; Boeing Stratocruiser accommodating from 51 to 114 passengers cruising at 340 m.p.h. at 25,000 feet and having a maximum range in excess of 4000 miles have proved to be more economical for operations over larger distances. Their operating expenses decrease most sharply as flight lengths increase from 200 to 800 miles. Majority of these long-haul transport aircraft have a larger capacity for payload, have proportionately a lower fuel consumption, can operate at higher altitudes and have pressurised cabins for passenger comforts. Improvements in aerodynamic efficiency and substantial reduction in fuel consumption have also affected their cost structure.

As in the case of short-haul operations, fuel again dictates the range and the payload that can be carried. The major factor controlling payload on these operations would increase of fuel-load as the length of the stage is increased. When an aircraft designed to operate over a certain stage length exceeds this stage distance, the operating costs tend to rise as payload has to be reduced in favour of increased fuel-loads.

It will be thus seen that the operator's interest in fuel consumption lies in the proportion of the disposal load it absorbs, and consequently the more numerous the points of fuel supply the more economically air services can be operated. But on many routes refuelling facilities do not exist and it becomes necessary to carry extravagant fuel-loads. On such long-haul stages involving non-stop flights, the allowable payload is usually inversely proportional to the flight time, which means that the longer the flight time, smaller is the payload. Economics of long-haul operations is thus connected with the technical efficiency of the aircraft which would enable it to carry fuel-load at a minimum percentage of the aircraft payload capacity. If non-stop flights become necessary on account of lack of intermediate fuelling facilities as on over-water flights, operating conditions and the design of the aircraft must be adjusted to the desired range. Multi-engined airliners developed in the post-war years can now economically operate non-stop for about 1500 miles, but this optimum range is bound to increase in the near future. The operator must, therefore, avoid unnecessarily long stage distances in relation to the characteristics of the available aircraft if the over-riding intention is to obtain low cost of operation per seat-mile or ton-mile.

Even on the long-haul stages, one or two stops become desirable for the convenience of the passengers and the operator would therefore fix the stops combining the technical advantage for refuelling with the opportunity of getting traffic. If the operator is compelled to stop on account of the accident of geography for refuelling only and without getting any reasonable chance of getting payload, the stop would be uneconomic. Whatever may

be the character of the stop, time lost by such stops to time gained by utilisation is not very great in these situations. The operator has to balance the advantages involved in the terminal delays and the expenses of maintaining station personnel at the intermediate points with the payload that he may be able to get at these points. Where adjustments are made by the proper selection of the aircraft with the route characteristics, the operator may be able to get a reasonable load factor to make the long-haul operations profitable. Many of these routes have been uneconomic and they have been sustained by subsidies because of their prestige value and the era may soon commence when these routes may become self-supporting.

Though long-haul operations permit larger aircraft to carry bigger payloads with specialised power plant and engineering personnel, they need very costly items in the maintenance of the route organisation. Well-equipped bases all over route for refuelling, oiling and for repairs are needed besides the hangars, stores of spares and equipment. The maintenance of ground station personnel and administrative personnel at the intermediate points involves considerable expenditure. The salaries paid to the personnel are proportionately higher. Proper housing and medical facilities have also to be provided at remote places. Out-station allowances are usually very high as an inducement factor. From the administrative point of view, foreign exchange, transfer of funds, foreign taxes, communication by cable—all involve very high costs for maintenance of the out-station establishments on the routes. External operations on these stage-lengths usually involve a larger size of the crew in proportion to the passenger and cargo capacity. These operations also necessitate a change-over of crew at stopping places and the crew-housing costs have to be incurred. Traffic operations also involve their problem. Customs, immigration, inoculation need additional personnel and office accommodation in addition to the accommodation required for the over-night stay of the passengers under emergency circumstances. Cases are not wanting where carriers have been also compelled to

maintain their own power and water-distillation system at such stations.

Frequencies on the external services are limited by bilateral agreements and this means fixed schedules and lower utilisation of the aircraft. Infrequent schedules increase crew and office expenses in addition to the low utilisation obtained. If the operator is denied the rights of cabotage, he has no chance of getting a revenue load at an intermediate stopping place. External operations thus involve several factors over which the operator has no control. They naturally inflate the cost of operation on these routes and the rates are therefore proportionately higher. On the other hand an operator running his services on the internal routes, has some freedom from these factors and consequently low costs and low fares characterise the domestic operations.

LOCAL AND FEEDER LINE OPERATION

Feeder lines can be described as air services between small cities within a given area and between smaller communities and terminal points located at trunk lines. These services are confined to cities situated at short distances and have terminals at trunk line stops. The trunk-route carrier operating a large-sized or a medium-sized aircraft with faster speed may find it uneconomic to stop at these points to pick up traffic. Feeder lines, therefore, carry traffic from terminals to the small towns and from small towns to the terminals where an interchange is made of passengers, freight and mail with the trunk-route carriers. Local lines are thus auxiliaries feeding the trunk route operator at the terminal or stopping points. Besides serving intermediate points on a trunk-route, feeder lines may serve cities situated on either side of the trunk route or may connect two centres not accessible to railway or bus transport. A feeder airline may thus run number of services on different feeder routes all converging at terminals or stopping points on the trunk route. Feeder lines have, therefore, to operate on very short-haul stages with considerable frequency, the route pattern and the degree of

HB 30

frequency of operation being dictated for each airline by the local circumstances.

Since the function of a feeder line is to carry passengers, mail and freight on short-haul stages, the operational and the organisational procedure would be different from that of a trunk route carrier. A prospective operator getting into feeder line operations has, therefore, to meet number of problems peculiar to local conditions. The traffic potential on feeder routes is usually very low and before undertaking his job, the operator must study the prospects of such operations into very small details. The operator must first find out whether there is a substantial need for a local service and whether the smaller communities can afford to pay the reasonable fares charged. The operator need not purchase costly equipment for these operations. An aircraft with low initial investment, accommodating 4 to 12 passengers with remaining space for mail and freight, with a cruising speed of from 150 to 180 miles an hour, with a cruising range of 300 miles with full load and fuel and requiring a take-off run of not more than 1500 feet would be economical for these operations. Such an aircraft with bus-type interior need not provide for toilet, hostess service and free-meals facilities as on trunk line planes. The cost of operation for such an aircraft can be reduced only by increasing frequency and intensive operations. Though a single engined aircraft would be more economical, patrons of feeder services do value a twin-engined aircraft.[7] The size of the administrative organisation for a feeder line need not be also large as an elaborate depart-

[7] A Dakota has not proved to be serviceable for feeder operations in India. It shows lowest cost per ton-mile on its optimum stage length of about 350 miles. Any stage length of less than 350 miles would involve higher costs per ton-mile if operated with this aircraft. But in U.S.A., Dakota has been used on feeder routes as the traffic potential is large. British De Havilland Dove and Percival Prince, both 11 passenger planes better meet the requirements of feeder operators. De Havilland Heron also closely approaches the feeder line requirements.

mental organisation is not necessary. As compared with the operating expenses, the overhead costs of feeder lines are proportionately low on account of the small size of the organisation. At the same time greater efforts and managerial ingenuity are expected from the operator whose continuation in business would depend upon the successful development of traffic on economic basis. Mobilising local support and interest is therefore vital for these operations. Unless the right type of equipment is selected and the traffic potentialities are correctly estimated, the cost per seat-mile is bound to be very high. All over the world, feeder route operations have proved to be very expensive. Besides the low traffic potential of the smaller cities served by the feeder lines, there has been intense competition from the surface agencies. Feeder airlines, therefore, need subsidies at the present stage of aircraft technology and it would be really a long run dis-service to the entire air transport industry if expansion of feeder airlines is induced into areas which are best served by other agencies of transport. In those countries like India, where the domestic trunk route operations have not been yet placed on self-supporting basis, operation of feeder services would be a risky business. In fact, expansion of feeder routes at such a stage would endanger the whole air transport industry.

So long as traffic has not developed on the main trunk routes and there are no reasonable expectations of profitable operation of feeder routes, no operator would undertake to experiment with local services. Trunk-route carriers with adequate finances may, however, try to integrate some of the feeder services in the near future, but till then, independent feeder air services are bound to have very uncertain future.

Developments in helicopter are likely to open a new era in the history of air transport. It appears most likely that most inter-city flight travel would be done by helicopters flying from one city-centre to another. The transition from single-engined to multi-engined helicopter is likely to be very very rapid. The helicopter has already proved to be a suitable medium of commercial transport

suitable for distances upto 300 miles. Operated between the centres of the cities, it will offer a high degree of public convenience over all other forms of transport for distances between 50 to 300 miles. A 10-12 passenger helicopter is likely to be in commercial use by 1953. Larger of these helicopters with higher cruising speed should be economic for commercial use on scheduled services. The development of helicopter is thus likely to make substantial contribution to the feeder line transport in the near future.

CHAPTER III

EARLY HISTORY OF AIR TRANSPORT IN INDIA

EARLY EXPERIMENTS WITH BALLOONS

India's interest in aviation dates back to the Victorian period when balloon flights were a common form of adventure. We learn of a few balloon flights in Bombay and Calcutta from the contemporary press. It appears from the columns of the *Englishman* that one Mr. Joseph Lynn from Bombay made a flight on 27th November, 1877 from the Lal Bagh Gardens in Bombay at 4.40 p.m. and ascended to an altitude of about 7,500 feet. He made a landing near a stony quarry at Dadar. Mr. Lynn appears to have made another flight on 30th November, 1877 from the same place and took this time along with him one Mr. Gratton Geary. The balloon was, however, forced to descend into the sea after an hour's flight. Both these gentlemen were picked up in the sea by a country boat and were safely carried to Apollo-Bunder.[1] Calcutta press records of similar balloon flights. One Mr. Percival Spencer gave the Calcutta public a demonstration flight on 19th March, 1889. His balloon was named "Empress of India" and every assistance was given to him by the public in Calcutta in manufacturing the gas and in preparing the balloon for the flight. Encouraged by his first success, Mr. Spencer made subsequently a few more flights and also carried a few passengers with him for consideration. These balloon flights in India were mostly made by foreign adventurers and yet they created no small interest in the Indian public which gradually awoke to the fact that human flights had become an accomplished fact.

FIRST OFFICIAL AIR-MAIL

Between December, 1903, when Wright Brothers made their first flight at Kitty Hawk and 1911, considera-

1. Smith **Indian Airways, 111, p. 4.**

ble technical progress was made in aviation and as early as in 1909, the value of the aeroplane for defence purpose came to be recognised in U.S.A. and in Europe. While it is difficult to say where the idea of using aircraft for carrying postal mail started, the credit of inaugurating the first official air-mail goes to India. As a part of the famous Allahabad Exhibition held in February, 1911, the Posts and Telegraphs Department of the Government of India had arranged an aeroplane post officially labelled as "First Aerial Post, United Provinces Exhibition, Allahabad, 1911". On February 18th, 1911, Mono-Piquet, a French aviator, carried a sack of messages in a Humber biplane from the exhibition grounds to Naini junction, some six miles away. Piquet took off from the exhibition grounds at 5.30 p.m. along with the mail and returned again to the exhibition ground after delivering the mail in about thirteen minutes. The proceeds of the "Air-Mail Post" were made over for the benefit of the Indian Hospital Fund. Between 1909 and 1914, possible usefulness of an aeroplane for the carriage of mail and passengers was seriously considered in the United States and in Europe but it was not until 1918 that definite action had been taken in the direction of organised passenger and mail carrying. As early as 1917, the question of introducing air transport in India was under the discussion of the Indian Government in view of the great progress that aircraft had made during the war period (1914-18) and in September, 1919, it was decided by the Government to accept the principle of giving a monopoly for the carriage of mails throughout India to a single transport company.

In that year, the Indian Government had also signed the Paris Convention on Air Navigation and consequently had undertaken responsibilities for providing ground organisation and provision of meteorological and wireless services. The question of linking India with the outer world by air was first discussed in June, 1919 when a scheme was put forward by the Air Ministry in U.K. for the establishment of an air service between Cairo and Karachi. The objects of this scheme were mainly military, though the carriage of mails was also contemplated.

The Government of India supported the proposal and, on the understanding that a weekly service would be instituted, agreed to provide and maintain the necessary aerodrome and buildings from Karachi to Bushire, at an estimated cost of Rs. 13½ lakhs initial and Rs. 36,000 recurring. The British Government were to be responsible for providing the necessary aircraft, the pay and maintenance of the unit, the cost of flying and other liabilities. The proposal was, however, abandoned by the British Government, but was again revived in 1920 mainly on account of the needs of the British Post Office. Once again the Government of India declared themselves ready, if the scheme matured, to adhere to the understanding, which they had given in the previous year. They also offered to guarantee a sum of Rs. 1 lakh per annum for three years towards the deficit in the working of the civil mail service. This offer was, however, not accepted owing to the un-settled conditions in Arabia and Iraq and the proposal was dropped. It was, however, realised that even in the absence of such a service, India had a genuine interest in the upkeep of a connecting link, for use when necessary, between the Middle East and Karachi, and in 1921, the Government of India agreed to make a small contribution to the maintenance of the aerodromes at Bushire, Bunder Abbas and Charbar equivalent to half the actual expenditure upon them, limited to £850 for capital and £400 for annual recurring charges. This, together with a similar contribution from the British Government, was considered as sufficient for the provision of absolutely essential facilities.

The Cairo Conference of March, 1921 was responsible for giving an added interest to the scheme. This Conference was called to consider the developments that had then taken place in the Middle East. After the termination of the World War I, the work of establishing peace and order in Egypt, Palestine and Iraq was entrusted to Britain which had maintained a number of Royal Air Force Squadrons in these countries. It was at the instance of Mr. Winston Churchill, then the Secretary of State for Air, that it was decided to forge

a link in the Imperial chain of communications by organising an air-route that would connect Baghdad with London via Cairo. Subsequent events followed quickly and the first official air mail from London marked "London to Iraq by Air, Cairo to Baghdad" left London on 4th August, 1921. It was this air route that came to be expanded on to India in the subsequent years.

The Imperial Conference of 1922 was largely responsible for emphasising the importance of Empire Communications and the unity of the Empire and the consequent necessity of developing air communications within the Dominions. As the result of these deliberations the Imperial Airways, Limited was incorporated on 31st March, 1924, and was made the chosen instrument for implementing the policy of opening up of the Imperal Air Communications. The London-Cairo route was immediately taken over by this company and was extended to Basra in the Persian Gulf in December, 1926, passengers for India being transferred at that port to steamers, saving about five days on the normal journey to India. The ground organisation on this route was quite rudimentary and landmarks were also few. The type of aircraft employed on the route was the De Havilland 66 or Hercules, biplane which had a maximum speed of 110 m.p.h. For a long time, it was impossible to extend the route to Karachi owing to the refusal of the Persian Government to ratify their earlier provisional agreement with the British Government.

At the Imperial Conference held in London in 1927, important decisions were taken for the development of air communications. Sir Samuel Hoare, as the Secretary of State for Air, had outlined a new policy which envisaged closer contacts between Britian and the Overseas possessions through the development of Empire air routes. Air transport was thus to be used for re-enforcing the Empire unity for strategical and commercial purposes. The plan proposed provided for the organisation of Empire routes by adequate provision of ground, meteorological and wireless facilities under the guidance of U.K. The Dominions and the Colonies were, however, free to develop their domestic air-routes in a way they

liked. At the same time, they were expected to organise the domestic routes in such a manner that they were connected with the Empire Services at their end. In the meanwhile, negotiations were being continued with Persia and in 1929 Imperial Airways were permitted to fly along the Persian Coast once weekly in each direction. In the meantime, arrangements had also been made whereby British aircraft could operate through Italy. The first aircraft to inaugurate England-India Service left Croydon at 10 a.m. on 30th March, 1929 and arrived at Karachi at 8 p.m. on the 6th April. Similarly, the "City of Baghdad" carrying the first Indian mail and freight left Karachi for Croydon on the 7th April, completing the journey in about the same time. The London-Karachi route extending some 5,000 miles, thus came to be operated once a week in each direction. With the linking of London with Karachi, it now became necessary to make arrangements for extending the air service from Karachi to Delhi, the headquarters of the Government of India. The first step was then taken on 20th December, 1929 when the Government of India employing aircraft chartered from the Imperial Airways, instituted a service from Karachi to Jodhpur and then on to Delhi. The special feature of this arrangement was that the Delhi-Karachi service was conducted by the Imperial Airways with their own machines, but on behalf of the Indian Government. Theoretically, the service of the Imperial Airways terminated at Karachi, but for practical purposes it really extended upto Delhi. This arrangement worked for a short period only, that is from December 1929 to December 1931. Subsequently, Government of India withdrew their support from this extension. As a part of India Government's retrenchment programme, the contract with the Imperial Airways was not renewed and the work of carrying mails only from Karachi to Delhi was entrusted to the Delhi Aero Club. This arrangement came to an end about the middle of 1932, as it was only a transitional measure pending establishment of permanent arrangements. In 1932, the Imperial Airways decided to extend their services to Singapore and then on to Australia. Between 1929 and 1932, the

Indian Government had also made substantial improvements in the ground organisation on the Karachi-Calcutta route in view of their responsibilities under the International Convention of 1919. Permission to fly over the Trans-India route had also been granted to the Dutch and the French Air services and under no circumstances, the Indian Government could refuse a similar concession to the Imperial Airways. It was, however, considered necessary that on the Trans-India route extending to 2,500 miles, cabotage rights be reserved, because, if foreign operators were permitted to cater traffic, originating and terminating within the frontiers of the country, nothing would be left for the Indian enterprise, public or private, except the domestic routes. Negotiations were therefore opened by the Indian Governmenet with the Air Ministry in England in 1932 and the results of these negotiations were announced in the Press Communique dated 9th May, 1933.

INDIAN TRANS-CONTINENTAL AIRWAYS, LIMITED

As the result of the negotiations, a new company known as the Indian Trans-Continental Airways (I.T.C.A.) was formed in May, 1933, mainly with a view to secure India's participation in the Trans-India service scheme. The authorised capital of the Company was Rs. 10 lakhs of which the Imperial Airways held Rs. 5,10,000/- the Indian National Airways (established in 1933) Rs. 2,50,000/- and the Government of India, Rs. 2,40,000. The Imperial Airways thus contributed 51 per cent of the capital, while the Indian National Airways and the Government of India contributed 25 and 24 per cent respectively. This new company was to operate the sector between Karachi and Singapore alternately with the Imperial Airways. The management of the Company was entrusted to a Board of Directors, consisting of seven members. Of these, the Imperial Airways nominated four, while the Indian National Airways and the Indian Government nominated two and one respectively. As all managerial and operational

responsibilities of I.T.C.A. were in the hands of the Imperial Airways, the arrangement was of little benefit to India in the art of operating commercial airlines. It was further agreed between the Government of India and U.K. that the arrangement for joint operation of Karachi-Singapore sector was to be in force till March 1939. As the Indian Government were not in a position to subsidise the operations over the Karachi-Singapore sector, the Air Ministry in U.K. promised to subsidise these operations of the Imperial Airways, for a period of six years ending on 31st March, 1939. The subsidy was to be £40,000 for the first year of the through service to Australia, £30,000 for the second and third year and £20,000 a year for the remaining period. This grant was allocated in definite proportions for various sectors of the route. So far the Karachi-Singapore sector was concerned, the subsidy was to be equally divisible between the Imperial Airways and the I.T.C.A. In view of their inability to subsidise the Indian sector, the Indian Government promised to remit custom and excise duties on aircraft spares, petrol and oil, and to provide free landing and housing facilities at the Indian aerodromes.

It is obvious that the terms granted to the Imperial Airways in the formation of I.T.C.A. were highly unfair to India. The Finance Member of the Government of India had, in fact, assured the Standing Finance Committee at their meeting on the 14th March, 1929, that in any formation of a Company to operate over the Trans-India route the Government would secure the necessary control over the affairs of the Company by reserving 75 per cent of the voting rights. It was really on the basis of this assurance given by the Finance Minister that the Standing Finance Committee had accorded their approval to the very idea of the scheme. But when I.T.C.A. was formed, the Indian Government thought it desirable to set aside their own promises and permitted a non-Indian concern to hold 51 per cent interest in the capital of the new Indian company. Thus, the fundamental pre-requisites viz. national share-holding and national control were set aside in the case of an

industry which has such a vital bearing on the security of the country. There was no reason why the Government themselves should not have contributed the whole of the capital or should not have permitted the public to contribute in option. Between the meeting of the Standing Finance Committee and 30th of September, 1933, the Indian legislature was kept in dark of what was passing behind the curtain and when finally a call was made on the Indian Government to contribute its share-quota, Sir George Schuster informed the legislature for the first time of the arrangements contemplated. It, therefore, appears that the Indian Government were working under pressure from U.K. and so could not fully exercise their bargaining strength.

The Indian Government had uptill now utilised the services of K.L.M. and the French Air Orient to carry mails to the countries east of India. With the extension of the Empire route to Singapore, it now became possible to divert such mail to the Empire Services. The first stage in the establishment of the Karachi-Calcutta sector was completed on 7th July, 1933, and from 1st October, 1933, the Karachi-Calcutta service came to be extended to Rangoon. A link was also established with Singapore on 18th December. The Karachi-Singapore sector extended over nearly 3,000 miles and a fleet consisting of four Armstrong Whiteworth XV (Atlantas) was employed in their joint operation by the Imperial Airways and the I.T.C.A.

Subsequently Singapore also came to be connected with Brisbane in Australia from 9th December, 1934. The longest air route extending over some 12,700 miles was thus completed. The time required by air services to operate this route was normally 12 days but in the course of next three years, the time was reduced from 12 to 8½ days. As the result of these developments, both the K.L.M. and the French Air Orient laid plans for the provision of faster and larger aircraft for their services to the Far East. The Dutch and the French services were comparatively faster as these required 5¼ and 5½ days respectively between Amsterdam and Karachi and Paris and Karachi. On the other hand

till the end of 1933, the actual time taken by the Imperial Airways to fly the London-Karachi sector was nearly 7 days. As the British Services had proved to be more slow, many of the patrons of air services preferred to travel by the Dutch and the French air services.

EMPIRE AIR MAIL SCHEME

The next phase of development was the introduction of Empire Air Mail Services under which all the letter mail between the Empire countries on the U.K.-Australia and U.K.-Africa routes was to be carried by air, no surcharge being levied for the purpose. So far India was concerned the scheme involved:—

(1) A frequency of five services a week on the London-Calcutta sector as against a six days' schedule in the week. Out of these five services, two were to terminate at Calcutta while the remaining three were to proceed to Singapore and then to Australia.

(2) Speeding up of the London-Karachi service with a view to reduce the time to less than three days.

(3) Carriage of all first class mail by air to participating Empire countries.

(4) Reorganisation of the internal routes and air services in India and other Empire countries to the frequency of the Empire services.

When the plans of the Empire Air Mail Scheme were announced in U.K. in December, 1934, the Indian Government decided to participate in the arrangement. So far India was concerned, the scheme involved five services a week, two of which were to be worked by land-planes while the remaining three were to be operated by flying boats across the sea-plane route which the Government of India had agreed to prepare. The two land-plane services were to terminate at Calcutta but the flying boat services were to be continued to Singapore and then on to Australia. The I.T.C.A. and the two Indian airline operators, viz. the Indian National Airways and the Tata Airlines were to operate their respective routes with the same frequency as the Empire

Services to India so as to enable the public to receive their mails five times a week and to despatch them five times a week.

The Government of India, in consequence, had to reorganise and reequip the ground organisation on the land-plane route from Karachi to Calcutta. The objective was to make the air route serviceable both for day and night service. So far as the sea-plane route was concerned, it was agreed between the Government of India and the Air Ministry in England that the whole cost of organising the sea-plane route was to be incurred by the Government of England, but the organisation and the ownership were to remain with the Indian Government. The work of organising the sea-plane route was accordingly undertaken in August, 1937, and substantial progress had been made towards completion by February, 1938 when the flying boat service to be operated by the famous Short C class or Empire flying boat was about to be inaugurated. The route established was as follows:—

(1) Karachi (Keamari — West Wharf)
(2) Udaipur (Rajasamand Lake)
(3) Gwalior (Madhav Sagar Lake)
(4) Calcutta (Hooghly River, Akra Beach)
(5) Akyab (Harbour—Fakin Point)
(6) Rangoon (River)

So far as navigation aids were concerned, where the flying boat route followied the land-plane route, the wireless and the meteorological organisation which then existed for air services was to be utilised for the flying boat services. On the internal routes, improved facilities were similarly established to meet the increased frequency of service. The Government of India also promised the Imperial Airways certain concessions like the remission of excise and duties on petrol and oil consumed by the aircraft operating on the trans-India mail service. A similar remission was granted in respect of housing and landing charges at the Government aerodromes. The value of the first concession was

estimated to amount to Rs. 5 lakhs annually and that of the second in the neighbourhood of a lakh of rupees per year. It was then expected that the whole scheme would cost the Indian exchequer an annual net amount of over Rs. 12 lakhs including the petrol subsidies to the domestic operators.

The Empire Air Mail Scheme was inaugurated in June, 1937 when the route to South Africa came to be operated. The second stage was commenced on 23rd February, 1938 when the two flying boats "Coolangatta" and the "Centurion" left Southampton for Karachi with unsurcharged mails. The subsequent stages were reached when an extension was made from Singapore to Australia on 28th July, 1938 and another one to Hong-kong on 2nd September, 1938.

In view of the additional responsibilities, the I.T.C.A. had to re-equip itself for the contemplated expansion of its activities. From July, 1933, it had taken half the share with the Imperial Airways, Ltd., in the operation of the Karachi-Singapore sector and the company was now called upon to increase its frequency to five times a week over the same sector. It was, therefore, decided to increase the capital of the company to Rs. 32 lakhs. This additional capital was subscribed by the three shareholders in the proportion of their holding i.e. 51 per cent by the Imperial Airways, 24 per cent by the Government of India and 25 per cent by the Indian National Airways. With the extra capital thus made available I.T.C.A. decided to purchase four Armstrong Whiteworth Ensign Aircraft in place of Atlanta Aircraft purchased in 1933.

As a consequence, the foreign air services also decided to accelerate their services to and across India. From October, 1937, the K.L.M. increased its frequency on the Amsterdam-Batavia route to three services per week. In addition the Company introduced a superior aircraft in DC-3. Air France, which was hitherto operating one weekly service in each direction on the Paris-Saigon route also introduced a new aircraft and tried to maintain a parity with the other two services with 2½ days' schedule from Europe.

The Empire Air Mail Scheme can thus be described as the main spring in the expansion of the air services in India and in other participating countries. So far, it related India, it brought about the introduction of larger aircraft and development of passenger and freight traffic and speeding up of the air mails between India and the Empire countries. Business correspondence consequently came to be accelerated on the postal side, all first class mail, that is, letters and post cards and all other postal articles paid at the letter postage rates, as well as money orders, came to be carried extensively by air between the participating countries without any surcharge. All second class mail such as printed and business papers, sample packets, insured boxes and parcels were however carried by surface routes. The public and the business community in general came to be benefited as these services enabled the public to receive mails five times a week and to despatch them five times a week.

The expansion of air-mail correspondence may be illustrated by comparing the figures for the years previous to and after the introduction of the new scheme. Before the inauguration of the scheme, the weight of airmail carried by the Imperial Airways to and from India was approximately 50 tons a year, in each direction, on an average of 1½ ton on each service. As the result of the abolition of air-mail surcharges, the weight of the mail carried to and from India exceeded the estimated by nearly 18 per cent, 460 tons being carried as against an estimate of 388 tons in the very first year of the operation of the scheme upto 19th February, 1939.

With the outbreak of hostilities in September 1939, all the resources of the Empire Air Services came to be diverted to the needs of war and the all-up scheme which had operated for about 1½ years came to be suspended and contacts with the Empire countries had to be subsequently established with the assistance of R.A.F. Transport Command.

Between 1929 and 1938, the external services were thus mainly engaged to carrying the mails from and to India, Passenger traffic being of meagre proportions.

TABLE 6

Karachi Air Port

Year	Imperial Airways, Ltd.		Foreign Air Services.	
	Number of passengers.		Number of passengers.	
	To India	From India	To India	From India
1929 (9 months)	No record			
	No record			
1930	78	70		
1931	80	74	32	18
1932	150	143	16	30
1933	216	211	59	64
1934	280	326	31	71
1935	455	528	186	198
1936	450	579	314	404
1937	472	448	488	482
1938	696	792	586	667

TABLE 7

Calcutta Air Port

Year	Imperial Airways, Ltd. & I.T.C.A., Limited.		Foreign Air Services.	
	Number of passengers.		Number of passengers.	
	To India	From India	To India	From India
1932	—	—	41	28
1933	—	3	108	77
1934	45	55	42	27
1935	52	46	86	56
1936	92	81	160	120
1937	90	112	180	128
1938	308	115	192	35

In view of the infant character of the air transport industry during the period 1929-38, it was but natural that the extent of passenger traffic, to and from India, was very small. From 1934 onwards, the passenger traffic was showing signs of growth which could not be maintained after 1938 on account of outbreak of

hostilities in September, 1939. - Even then, it is remarkable that the total number of passengers increased from 1890 in 1937 to 2741 in 1938. Out of this, nearly 50 per cent of the traffic was carried by the Imperial Airways in 1938. The growth of traffic on the external service in this period may be largely attributed to increased frequency of services, better regularity and larger and speedier aircraft. In 1939, the old agreement with the Imperial Airways was about to expire and an opportunity was available for the Government of India to reconsider the relations with the external services. But even before the expiry of the agreement, the Government made a new agreement with the Imperial Airways for a much longer period than before and that too without giving any opportunity to the Indian legislature and the public to offer their views. Besides perpetuating the control and domination of the Imperial Airways, the I.T.C.A. was now totally excluded for a period of 15 years which was the period of agreement, from operating over the trans-continental sea-plane route. It must be noted that the I.T.C.A. never operated or shared in the sea-plane route and was never intended to do so. It only shared the Karachi-Singapore route. When the Empire Air Mail Scheme came into force, the whole arrangement was to be revised and various proposals were under consideration when the promotion of British Overseas Airways Corporation and the extinction of Imperial Airways started a fresh set of proposals. These were under discussion when the World War II started and nothing was done any further.

CHAPTER IV

GROWTH OF DOMESTIC AIR TRANSPORT IN INDIA 1920-38

(1) THE INDIAN AIR BOARD

The question of introducing air services in India was under discussion of the Government of India as early as 1917. After the terminatiin of the World War I, it was decided in September, 1919, to accept the principle of giving a monopoly for the carriage of mails throughout India to a single transport company. When tenders were invited, it was discovered that owing to lack of previous experience and scanty information on the whole subject, right type of response was not forthcoming. The question was reconsidered in December, 1920 and it was decided that in lieu of giving monopoly to a single transport company, the following policy should be adopted.

The Government of India were to prepare air routes between Bombay and Calcutta and Calcutta and Rangoon, acquiring and levelling the necessary aerodromes, constructing hangars, quarters and godowns, providing the requisite ground equipment, lighting, staff and meteorological facilities, and holding themselves responsible for all maintenance charges. It was further decided that any money available should, as far as possible, first be devoted to the Calcutta-Rangoon section. Finally when any route or section of a route was completed, tenders for an airmail service over completed section or sections were to be called for. Except laying down this policy, nothing was done by the Government to give effect to it.

The Indian Air Board which was a part of the Industries and Labour Department of the Government submitted in May, 1926 an important Memorandum to the Government on Civil Aviation. The Board observed that India was admirably suited for the development of civil aviation as large industrial and commercial centres are situated at considerable distance. The meteorolo-

gical conditions are also excellent over a large part of the year. The Board, however, thought that there was no possibility of establishing commercial services in India without substantial subsidies to the operators in the earlier years of their existence. Time had, therefore, arrived for the Government to accept definitely the principle of subsidising the commercial air services from the Indian revenues. If India would fail to take part in the experimental stage, she would lose her chance of obtaining her propor share in the air transport business. But subsidies alone were not enough. What was required more, was the employment of Indians and Indian capital in the business. The Board also recommended that all landing grounds and their necessary equipment should be the property of the Government who should be responsible for the provision of the wireless and the meteorological facilities also. Except laying down a chain of landing grounds across the country from Karachi to Victorial Point in Burma and creating the civil aviation department in 1927, the Government of India were not then in a position to do anything further. Between 1925-1928, number of experimental flights were being undertaken across the trans-India route by the British, the French and the Dutch aviators to assess the possibilities of air services to Far East. By 1929, the French and the Dutch airlines had already established air services to their Far Eastern possessions across the trans-India route. The Imperial Airways who were operating their service to India since 1929, subsequently decided to expand their services to Singapore across trans-India route and then on to Australia. These developments were responsible for the promotion of Indian Trans-Continental Airways. In 1931-32, Government of India realised the need to develop feeder services in India and accordingly started negotiations with Indian business houses. These negotiations subsequently led to the promotion of Tata Air Lines and Indian National Airways. The air routes developed from 1932 to 1938 were the auxiliaries to the operations of the Imperial Airways who were entrusted with the work of linking the far flung parts of the British Empire.

TATA AIR LINES

As early as July, 1929, Tata Sons, Limited had submitted to the Indian Government a scheme for starting an air service from Karachi to Bombay. The scheme was subsequently withdrawn and a second scheme was again submitted in the same year in November. The scheme involved three alternatives viz.

(1) an air -mail service between Karachi and Bombay,

(2) an air-mail and passenger service between Karachi and Bombay and

(3) a sea-plane service between Karachi and Colombo.

The first of the three alternatives involved a payment by the Government of an annual subsidy of Rs. 1,10,000 in return for which all mail was to be carried. The scheme was, however, rejected by the Government as they thought that the saving of time provided by the scheme was very small for remuneration demanded. A third scheme was, therefore, submitted by Tata Sons. in April, 1930, in which they asked for a payment of Rs. 4/- per lb. for the carriage of mails with a guaranteed income of Rs. 98,000/- a year. The Retrenchment Committee of the Government were then considering the proposal to abandon the scheme for Karachi-Calcuttta extension as a measure of general retrenchment and the Government were not, therefore, willing to accept this third proposal also. In 1931, Tata Sons submitted a fourth scheme which envisaged an air service between Karachi and Madras with an extension to Colombo. Negotiations this time succeeded and a ten-years agreement was made with Tata Sons in 1932 for the operation of a weekly service between Karachi and Madras via Bombay thus making contact with the Imperial Airways service from England to Karachi. The intermediate stoppages as initially decided were to be Ahmedabad, Bombay and Bellary. The mails were to be carried over this route at a rate which included a surcharge collected by the Posts and Telegraphs Department. Surcharged mail was thus the traffic foundation for the service. The mail service was to receive no subsidy from the Govern-

ment and the operator was to carry the risk of inadequate traffic loads. As a result of this agreement, the Karachi-Madras airservice was inaugurated on the 15th of October, 1932. In the initial stage two De Havilland Puss Moth Aircraft capable of carrying a load of 350 lbs. of mail and cruising at 105 m.p.h. were used. Since the service was primarily intended for the carriage of mails, only a few passengers and a small freight were carried. Hyderabad and Bhuj were included as regular halting places on the route in January, 1935 and April, 1937 respectively as financial subsidies were promised by the Hyderabad and Cutch States. The service frequency was increased on this route in January, 1935 to match with the increased frequency of Croydon-Karachi service. A new aircraft was now placed on the service. This was the single-engine low-winged monoplane viz. Miles Merlin of 200 h.p. capable of an operating speed of 125 miles per hour. Though the capacity of the aircraft was adequate for the increasing mail loads, it could hardly accommodate one or two passengers. Madras was linked with Colombo in February, 1938 and the frequency of service on the Karachi-Colombo route came to be increased to five times a week to match the increasing frequency of the Empire Service to Karachi. The Karachi-Colombo route extending over 1,845 miles was flown over in one and half days as against four days and fourteen hours by train. How passenger traffic was a by-product of the service is illustrated by the following table:—

TABLE 8

Karachi-Colombo Route.

Year	Mails, lbs.	Passengers.	Freight lbs.
1932 (15 Dct. to 31 Dec.)	2,974	1	53
1933	23,485	8	293
1934	41,487	14	111
1935	67,625	40	364
1936	81,004	69	983
1937	101,901	109	3,520
1938	429,999	514	11,845

Prior to 1938, there was very little passenger and freight traffic and the upward trend in 1938 may be attributed to introduction of speedier and larger aircraft.

With the introduction of the Empire Air Mail scheme, the terms of agreement with Tata Sons Ltd. were revised in 1937 and a new 15 years contract came into effective operation as from 28th February, 1933. The principal features of the contract were:—

(a) that the Karachi-Madras route was to be extended to Colombo under arrangement with the Government of Ceylon,
(b) the service was to be operated with the same frequency as the Imperial Airways Service to Karachi which was expected to be 5 times a week and
(c) the remuneration to the company was to be a guaranteed payment by the Government of India of Rs. 15 lakhs a year for the carriage of mail on the Karachi-Colombo route upto 500,000 lbs. plus Re. 1/- for each lb. of extra mail.

The Government of Ceylon had also agreed to share the remuneration to be paid to Tata Sons to the extent of Rs. 4½ lakhs per annum representing the remuneration for the conveyance of Ceylon mail on the services. A penalty of Rs. 1,000/- was to be levied by the Government of India in respect of every flight, required by the Agreement, which was not operated by the Company. A penalty of Rs. 500/- was also laid down for each delayed flight.

In October, 1935, Tata Sons inaugurated a seasonal air-service from Bombay to Trivandrum. The route was nearly 780 miles long and farther than London to Vienna. In March, 1938, this service was extended to Trichinopoly so as to make contact with the Karachi-Colombo service. The service was weekly in each direction with halts at Goa and Cannanore. The Miles Merlin aircraft, employed on the service, was able to show a remarkable saving of time over the surface carriers. Thus, it was possible

to gain 20 hours on the journey from Bombay to Goa, 42½ hours from Bombay to Cannanore and nearly 46 hours from Bombay to Trivandrum. The service did not show good prospects in the few years of its working as can be seen from the following figures.

TABLE 9

Bombay-Trivandrum-Trichinopoly Service.

Year	Mails, lbs.	Passengers	Freight lbs.
1935-36	209	32	—
1936-37	194	21	—
1937-38	385	51	179
1938-39	76	37	76

During the war period, the service was suspended and the question of reviving this link service was once again taken up in Janaury 1946.

The third service which Tata Air Lines were operating was the Bombay-Delhi service, Via Indore, Bhopal and Gwalior. The service was inaugurated as a bi-weekly service from 8th November, 1937 and was operated with Waco Aircraft. The service was operated during the fair season only as the ground organisation was not suitable for monsoon operations. Gwalior, Indore and Bhopal States had provided aerodrome facilities and some financial assistance. After the outbreak of war in 1939, the Bombay-Delhi route was taken up by the R.A.F.

TABLE 10

Bombay-Delhi Air Service.

Year	Mails, lbs.	Passengers	Freight lbs.
1937-38	161	103	54
1938-39	48	85	244

Tata Sons were also interested in the operation of Bombay-Calcutta route and as early as 1939, they had submitted to the Government a scheme for Bombay-Calcutta service. The original scheme envisaged a non-stop regular night service completing the journey in about five hours, the journey being done in multi-engined aircraft, providing sleeping accommodation and cruising at 200 miles per hour. Sir Frederick Tymms then the Director General of Civil Aviation surveyed this route in April, 1940. The scheme was, however, postponed on account of the war conditions. Besides scheduled operations, Tata Air Lines operated charter services to various parts of India, the rates depending upon the character of the route and the aircraft and its capacity. Tata Airlines thus registered a steady but somewhat slow progress from year to year inspite of considerable difficulties in the initial stages such as the absence of ground facilities and paucity of traffic available in the shape of mail, passenger and freight.[1] With the declaration of war in 1939, the operations of the Company were placed on a war footing under which services were run directly for the Government and Military authorities. By the end of 1938 Tata Air Lines had flown 1,083,155 miles, and had carried 740 passengers, 431,769 lbs. of mail and 12,232 lbs. of freight.

INDIAN NATIONAL AIRWAYS

Indian National Airways were promoted by Messrs. Govan Bros., Limited and incorporated in May, 1933 with an authorised capital of Rs. 30 lakhs. The Company was inaugurated with an object to develop feeder routes and the Government of India had given the Company an undertaking that no company other than I.N.A. would be given mail contract or a subsidy for the operation of services in the north and east of the main Empire route within India. The first air-mail and passenger service was

1. On the eve of World War II, the Company's fleet consisted of DH.86 (4 engines) DH Rapides (2 engines) and single engine Wacos.

inaugurated on a weekly basis on the 1st December, 1933, between Calcutta and Rangoon, intermediate between the services operated by I.T.C.A. and the Imperial Airways. The service operated via Chittagong, Akyab and Bassein, completing the journey in about 9½ hours against 3 days and 2 nights by a journey by steamer. The service was operated by a Dragon Moth aircraft which could carry a crew of two, five passengers and a total payload of 1200 lbs. A mail contract was obtained a little later under a short term agreement and the frequency of service was increased to twice weekly. The number of passengers carried in 1933 (December only) 1934 and 1935 was 42, 242 and 232 respectively With the extension and duplication of I.T.C.A's service from Calcutta to Singapore, the local service of I.N.A. became superfluous and was therefore closed in August, 1935.

A second service was inaugurated in December, 1933. This was the Calcutta-Dacca service. No mail contract was obtained, but a short term agreement to use the service for the carriage of mails on payment of a poundage rate was effected. The time taken by the air journey was 1½ hours as compared with 16½ hours by a combined rail-steamer journey. Thus a substantial saving of time was obtained. The rates were reasonable and yet the passenger traffic failed to develop. The number of passengers carried in 1933 (December only), 1934, 1935, was respectively 105, 501 and 268. The quantity of mail and freight carried was also very small. Due to inadequacy of funds the service was closed in June, 1935. The total losses in respect of Calcutta-Dacca and Calcutta-Rangoon services amounted to Rs. 5 lakhs on the capital.

In December, 1934, the Company established an air-mail service between Karachi and Lahore linking with Imperial Airway's service at Karachi. The service was to carry such mail as the public offered at rates which were covered by the surcharges collected by the Posts and Telegraphs Department. As the Karachi-Lahore route was not organised for night flying, the service had to be operated during the day time. The saving of time over surface transport was nearly 24 hours. With the duplication of the Empire Service to Karachi, from

January, 1935, the Karachi-Lahore Service had also to be duplicated. But this caused reduction in the average load per trip in each direction and an increase in the operating costs. The mail payments were inadequate as the revenue from passenger and traffic was very small. In 1935, the cost of company's organisation was Rs. 214 lakhs and against this, the company was receiving only Rs. 70,000 from the Government for the mail contract and Rs. 31,800 for the maintenance and operation of Government aircraft under a contract. This left a deficit of Rs. 1,12,000. When the Company represented to the Government their inability to operate their Karachi-Lahore service, the matter was reconsidered by the Government. The Empire Air Mail Scheme was expected to be inaugurated in 1937 and consequently frequency on the feeder routes had also to be increased to the same frequency as of the Empire Services. The Government feared that besides the dislocation of mail traffic on feeder routes, failure of I.N.A. would have serious consequences on the promotion of air transport in India. For all these reasons, the Government agreed to make up the deficit of Rs. 1,12,000. The subsidy was paid in 1936 and again in 1937 (upto 10th of December only) with a view to give breathing time to the company until the all-up scheme was inaugurated. From 11th December, 1937, the Karachi-Lahore service came to be operated under the new 15 years' contract under which the Company was to be paid a minimum sum of Rs. 3.25 lakhs per annum for the carriage of mails upto 1,30,000 lbs. annually and mails in excess of this figure, in any one year, were to be paid at a fixed additional rate of Re. 1/- per lb. A penalty was to be levied in respect of every flight required by the agreement which could not be operated by the Company and Rs. 150/- for each delayed flight. With the inauguration of the all-up scheme, the service frequency was increased to five per week and the Company substituted new Beech aircraft for the old fleet which consisted of Perceival Gull, the Vega Gull and the Fox Moths. Besides these, the Company's fleet between 1933 to 1939 consisted of D.H. Dragons (2 engines) Aurox and Waco. From

November, 1938, the Karachi-Lahore service was also extended to Delhi. With the declaration of war, company's organisation was diverted to serve war needs.

As has been previously observed, company's early efforts to develop non-mail routes, viz. Calcutta-Dacca and Calcutta-Rangoon, were not successful. The following table shows how even in the case of Karachi-Lahore service, the Company could not succeed in developing a passenger traffic.

TABLE 11

Karachi-Lahore Service.

Year	Mails lbs.	Passengers	Freight lbs.
1934	2,544	—	—
4th to 31st Dec.			
1935	25,698	2	75
1936	29,465	3	29.5
1937	34,795	13	168
1938	1,17,269	93	68

AIR SERVICES OF INDIA

This Cmpany was promoted by Mr. Kabali and was registered on 28th September, 1936 with an authorised capital of Rs. 10 lakhs and an issued and subscribed capital of Rs. 5 lakhs. The Company started its initial activities with only two aircrafts—a six seater "Courier" and an eight seater "Dragon Rapide" with two engines. A scheduled service was inaugurated on 15th November, 1937 between Bombay and Porbander with halts at Bhavnagar, Rajkot and Jamnagar. In January, 1940, the service was extended to Bhuj via Jamnagar as the Cutch State had agreed to give a subsidy of Rs. 6,000 each year for a period of three years. The aerial distance between Bombay and Porbandar is nearly 416 miles and this was flown over in about four hours as against 27 hours by rail. The substantial saving of time and the fares which almost approached second class railway fares enabled the air service to maintain a load factor much above 60 per cent. The service also carried surcharged inland

mail. In 1938-39 this service had carried 2,175 passengers. 1,331 lbs. of mail and 89,196 lbs. of freight. Navanagar, Bhavnagar and Porbandar States in Kathiawad had provided the initial ground organisation and had also granted some financial assistance to the company for the operation of the service. Thus the Air Services of India was promised an annual subsidy of Rs. 18,000 by Navanagar State for a period of five years, while Bhavnagar and Porbandar States had agreed to pay annully Rs. 12,000 and Rs. 11,000 respectively. The patronage extended by the Baroda State enabled the company to start from November, 1938 a twice-weekly service between Baroda and Amreli. The Baroda State had promised to grant an annual subsidy of Rs. 20,000/- for five years on a sliding scale of Rs. 2,000/- less each subsequent year. Another twice-weekly service was started from 5th January, 1939 between Bombay and Kolhapur. The Kolhapur State had agreed to grant an annual subsidy of Rs. 65,000/- for five years for the operation of this route. All the services of the company were seasonal in operation as route organisation was not suitable for all-weather flying. The services of the company succeeded in maintaining a high degree of punctuality in their operations throughout the period of survey. With the advent of war, the company closed its activities from October, 1940. The aircraft used on company's services comprised DH Rapides, DH Fox Moths (single engine) and DH Vega Gull (single engine).

The Air Services of India had to work right from the beginning under unfavourable circumstances. The company received no share in the carriage of mails under the all-up air mail scheme. Though the company received some support from Princes in Kathiawad, it did not get any material benefit from the carriage of surcharged internal mail. The bulk of the revenue came therefore from passenger traffic. In spite of these difficulties, the company carried in 1938-39, more than 75 per cent of the total passenger traffic of Indian air transport services.

Two of the domestic airlines viz. Tata Air Lines and Indian National Airways were thus started as auxiliaries

to the operation of Imperial Airways. They were provided free ground organisation and navigational and meteorological facilities. Both these airlines were working under a guarantee of payment for the mails they carried. Indian Trans-Continental Airways was in effect a subsidiary of Imperial Airways. The only airline which was mainly started for the promotion of passenger traffic was the Air Services of India. In the pre-war years, there was no regular system of licensing and so long as the companies conformed to the technical requirements of the Indian Aircraft Rules, it was open to any company to operate scheduled services provided ground organisation was available. This system worked well because air transport was not in great demand. Most of the services were operated with single-engined aircraft and the ground organisation as it then existed was suitable for the operation of these aircraft. Between 1932-1938 both Tata Air Lines and I.N.A. maintained an exclusive mail character and passenger and freight traffic was a by-product for the mail services. Only in the case of Air Services of India passenger traffic was the main source of revenue. When the all-up scheme was introduced in 1938, some increase in the passenger and freight traffic was recorded. The following are significant figures relating to scheduled air transport on the eve of the World War I.

TABLE 12

Indian Regular Air Services (Internal)

Year	Miles flown.	Passengers carried.	Mains carried. Tons.	Milage and regular air route.
1933	153,680	155	10.5	5,180
1934	345,771	757	21.3	5,830
1935	553,754	553	43.4	6,395
1936	496,539	349	49.4	6,483
1937	622,193	1,178	61.3	7,500
1938	1,412,334	2,104	244.6	6,700*

(* The reduction in milage is due to the omission of Burma)

The total miles flown on all routes had increased from 153,680 in 1933 to 1,412,334 in 1938 while the passengers carried increased from 155 to 2,104. This increase cannot be considered satisfactory if the growth of scheduled air transport in the leading countries of the world for the corresponding period is taken into consideration.

TABLE 13

Milage of Regular Air Routes including external services.

Year	Great Britain	India	U.S.A.	France	Germany
1933	11,670	5,180	47,687	21,450	71,228
1934	13,750	5,830	50,800	21,290	23,440
1935	18,739	6,395	52,461	24,451	22,291
1936	23,717	6,483	61,532	33,798	23,494
1937	26,679	7,500	63,656	38,750	31,880
1938	25,477	6,700	71,199	40,833	32,720

The period between 1933-1939 was essentially an experimental period and the airlines had to carry on their operations at the risk of inadequate traffic. The seasonal pattern of some of the services was also responsible for low utilisation of the fleet and equipment. In the absence of all-weather ground organisation and night flying facilities, operations over certain routes had to be suspended with the approach of Monsoon. The fleet of aircraft had to be, therefore, kept idle for four months of the year. After the lapse of such a long time, the operators had again to launch their publicity campaign. Maximum utilisation of the resources which normally contributes to the reduction of the operating and overhead costs was not possible under such circumstances. Cost of fuel, oil and insurance was the most formidable obstacle in the growth of air transport. Capital resources of the airlines were extremely limited. Airline business was looked upon as a hazardous one from the investor's point of view and both the Indian National Airways and the Air Services of India experienced considerable difficulties in collecting the share capital.

As the commercial banks were unwilling to grant any accommodation the responsibility of supplying short and long term finance had to be shouldered by the Managing Agents. Opportunities for charter operations were also very limited, though the rates charged were reasonable. Charter operations during the pre-war period were normally undertaken for fares which varied from As. 12 to Re. 1/4/- per mile depending upon the character of the route and the capacity of the aircraft.

TABLE 14

Charter operations

Year	1933	1934	1935	1936	1937	1938
No. of passengers carried.	44	326	483	401	440	385

The airlines were also suffering from a shortage of trained personnel. Foreign technicians had, therefore, to be employed and consequently very high salaries had to be paid. The foreign personnel, however, rendered excellent services to the cause of training of the Indian personnel for flying and ground-duties.[2] The history of

[2] In these early days of civil aviation, the Indian public took very little interest in the establishment and development of commercial airlines. Its main supporters were the promoters and few aviation enthusiasts. It was also very difficult for the Government to get support for the small measures which they then proposed to introduce for the cause of civil aviation. The circumstances under which civil aviation progressed in this period were explained by Sir Gurunath Bewoor in his speech in the Central Legislative Assembly on the 11th March, 1946. He observed that in the old days, it was very difficult to get money for civil aviation and the Director General of Civil Aviation had often to put up very big fights to get the money." In supporting his argument, Sir Gurunath observed that from 1936, the amounts allowed every year were about Rs. 17 or 21 lakhs and the highest figure

airlines since 1932 is, therefore, an appealing story of tireless energy and vision of the promoters. Though the growth of scheduled operations during the seven years was slow and limited, the service record of the airlines both in matters of safety and regularity had been such as would challenge the efficiency of operators in the foreign countries.[3]

before the war was Rs. 35 lakhs in 1939-40. On capital side, the expenditure was between Rs. 18 to 20 lakhs. Upto 1939, an expenditure of about Rs. 1.1/2 crores only was incurred on the provision of aerodromes, hangars, workshop and aerodrome and air-route lighting. Civil aviation could not consequently develop with these small funds. The pre-war attitude was that India wanted its money for other purposes and that damands of civil aviation could be reasonably postponed. If the Government appeared to be slow, it was encouraged in that direction by the Central Legislature also." Thus by 1939, airlines were not fully established. They had neither the support of the Government or the legislature or the public opinion.

[3] This is supported by the safety record for commercial flying in India in the four years 1935-38. More than 5.1/2 million aircraft-miles were flown during this period without injury to a single passenger.

CHAPTER V

WAR AND POST-WAR DEVELOPMENTS IN AIR TRANSPORT

In the pre-war period, the progress of civil aviation in India was steady and slow, developments being conditioned by the extent of financial allotments from the general revenues which inevitably were limited. The Civil Aviation Department of the Government of India, nevertheless, could provide a good part of the basic organisation for the Air Force in the initial war-years. With the outbreak of war in 1939, the Empire Air Mail Scheme continued to function for some months but virtually ceased after Italy's entry into the war and the closing of the Mediterranean route. Subsequently with the entry of Japan into the conflict, the whole system of air communication in India became of much greater importance and became the responsibility of Air Transport Command. Inevitably, all the resources of the three Indian Airlines were now diverted to the needs of war.

Air Services of India suspended its commercial activities in October, 1940 and the Company's activities came to be centred in the development of the Company's technical institution at Jamnagar which came to be utilised for training of personnel required by the Indian Air Force. The Tata Airlines and the Indian National Airways were entrusted with the operation of services in different parts of the country in accordance with the requirements of the Defence Services. Number of new routes came to be operated by the India Airlines within the Transport Command network with 'Lease-Lend' aircraft consisting of Expeditors, DC-2 and Dakotas. The Indian airlines were also entrusted with the work of servicing, overhaul and maintenance for the Air Force aircraft in the Workshops of the Companies. The companies were paid remuneration for their services on 'cost-plus' basis. The war operations enabled the Tata Air Lines and the Indian National Airways to improve

their financial position and to gain experience in handling more modern aircraft. A good opportunity was also available for both the airlines to train a good nucleus of technical personnel which made their position strong vis-a-vis the new entrants in the field. Though the airlines were primarily engaged in the carriage of military and civil priority traffic, considerable progress was made in their capacity and efficiency of performance. This is borne out by the following table.

TABLE 15

Year	Miles flown.	Passengers carried.	Excess Baggage & Weight lbs.	Mails Weight lbs.
1939	16,86,590	3,518	91,489	45,68,83
1945	33,20,277	24,090	852,068	4,80,616

THE POST-WAR PERIOD

With the termination of the hostilities in 1945, the Government controls over the Indian airlines were gradually withdrawn. As the 'Lease-Lend' aircraft was now withdrawn, the Indian airlines took the opportunity of purchasing larger aircraft from the United States Foreign Liquidation Commissioner. In January, 1946, the air services which were working under the controls of the Air Priorities Board were now placed on the commercial basis. The Government, however, retained priority control over a proportion of the load capacity of the services to meet essential transportation requirements for the Government passengers, freight and mail. As the capacity of external services to and from India was limited, it was not possible to meet all the demands for allocation of travel abroad and there was an accumulation of traffic in both directions from India far in excess of the capacity available.

One of the most noteworthy features in the post-war developments in civil aviation in India was the increased air mindedness in the travelling public. The Indian airlines had carried thousands of military per-

sonnel and freight of every description. India, thus, became not only air minded but internationally minded. Airlines too had now made considerable progress in the technique of booking, documentation and traffic handling of both passengers and cargo.

POST-WAR PLANS FOR CIVIL AVIATION IN INDIA

Even before the war had ended, Sir Frederic Tymms, then the Director of Civil Aviation, had prepared his plans for the development of civil aviation in India. These plans were submitted in 1944 to the Policy Committee on 'Post and Air' which expressed its general agreement with the policy defined in the plans. The Central Legislature was acquainted with these plans on February 24th, 1944, by Sir Gurunath Bewoor in the course of his speech on the bill to amend the Indian Aircraft Rules. By the end of May, 1945, the Government had issued a Press Note generally approving the broad plan of civil aviation, first indicated in the Yellow Book and subsequently accepted by the Policy Committee.

In his post-war plans, Sir Frederic Tymms had visualised the prime need of establishing of a system of air services linking the principal commercial and administrative centres in India and connecting with the principal neighbouring countries. A list of trunk air services, and those of essential links between these trunk services was drawn up. Under the plan, a route milage of 11,280 was visualised involving a total capacity of about 17 million ton-miles a year and requiring about 32 aircraft of the Dakota type on a utilisation of about 1700 hours per aircraft per year. These internal services were expected to provide employment for approximately 70 aircraft-crew and about 400 to 500 engineers and skilled mechanics. The capital investment for the operating organisation was estimated at Rs. 3 crores and the annual cost of operation at over Rs. 2½ crores. A careful estimate of the cost per ton-mile of operation and of the revenue was also made for a period extending over five years. As the operations

TABLE 16

TOTAL TRAFFIC. INDIAN OPERATING COMPANIES

Year.	Hours flown	Miles flown	Capacity Ton/miles Scheduled	REVENUE LOAD									
				Passengers			Excess Baggage & Freight		Mails		Newspapers		Total Revenue Load Ton/miles	Revenue Load factor
				No.	Passenger miles	Passenger Ton/miles	Weight Lbs.	Ton/ miles	Weight Lbs.	Ton/ miles	Weight Lbs.	Ton/ miles		
1939	14,049-41	1,686,590	—	3,518	1,329,116	119,334	91,489	16,312	456,883	201,435	6,960	964	338,045	—
1940	11,154-50	1,355,197	—	3,646	1,749,319	156,734	28,578	8,963	118,101	50,920	20,274	2,740	219,357	—
1941	10,515-20	1,292,397	—	3,747	2,437,802	218,380	37,173	11,921	142,132	55,615	2,338	821	286,737	—
1942	12,887-35	1,619,564	756,733	4,659	3,394,477	303,817	163,237	86,131	342,921	136,903	5	2	526,853	69.6%
1943	15,279-10	1,925,980	1,184,793	7,574	5,140,188	453,694	642,885	224,697	412,580	182,921	—	—	861,312	72.7%
1944	15,850-10	2,120,878	1,754,204	13,433	9,345,765	830,159	1,163,725	361,531	370,659	162,542	—	—	1,354,233	77.2%
1945	21,781-35	3,320,277	2,708,575	24,090	16,715,746	1,528,093	852,068	253,144	480,616	171,738	—	—	1,952,975	72.0%
1946	29,539-10	4,520,046	8,536,457	105,251	610,65,738	5,471,279	1,318,153	390,126	1,026,403	390,068	567,573	139,780	6,391,219	74.8%
1947	59,311-52	9,361,673	18,596,778	284,960	138,887,352	12,350,742	3,868,546	1,121,748	1,405,073	498,414	1,779,016	384,260	14,355,164	77.1%
1948	78,961-02	12,648,765	26,320,058	341,186	176,365,693	15,811,964	8,156,471	2,093,439	1,582,645	656,543	3,818,265	733,586	19,295,532	73.3%
1949	93,943-43	15,098,354	36,538,338	357,415	190,617,727	16,986,376	17,774,994	3,559,630	5,031,959	1,796,799	4,724,685	906,247	23,249,052	63.6%
1950	117,422-00	18,896,139	52,251,865	452,869	233,425,783	20,706,460	74,293,213	9,996,388	8,356144	2,602,636	5,713,542	1,108,842	34,414,327	65.8%
1951	118,684-03	19,497,505	57,403,065	449,462	257,242,870	22,841,275	83,236,493	12,459,761	7,181,611	2,766,131	4,428,736	9,479,982	39,015,149	68.0%

in the initial period were expected to be un-economical, Sir Frederic Tymms suggested a method for giving subsidy to the airlines to make up the deficit. It was further recommended by him that the operation of air services should be entrusted to a limited number of private companies not exceeding four and that in order to ensure an orderly development of air transport, a licensing authority should be created. Sir Frederic Tymms also submitted further plans relating to external air services, aeronautical training and ground organisation. It is on the basis of these plans that subsequent developments in civil aviation in India took place. These plans had provided very sound and farsighted measures for the expansion of the air transport and had the principal measures suggested functioned as intended, there would not have arisen the imbroglio in which civil aviation was subsequently ensnared.

The post-war plans as envisaged by Sir Frederic Tymms were generally approved by the Reconstruction Policy Committee for Post and Aviation in 1944-45 and in May, 1945, the Government announced that it would be their policy to permit development and operation of air transport services, internal and external, by a limited number of sound and reliable private commerical organisations, with their own capital and operated under normal commercial principles of risk of losses and prospects of gain. The Government further announced that in future the operation of air transport services would be subject to licence granted by the Government who may grant state assistance in specific cases with discretion and on conditions to be laid down in each case. In accordance with this policy Air Transport Licensing Board was established in October, 1946 which opened a new chapter in the development of air transport in India.

THE POST-WAR BOOM IN THE AIR TRANSPORT

Immediately after the termination of the War in 1945, there was a boom in the airline business which led to a large number of successful financiers to launch into

air transport enterprise. Several factors contributed to this state of affairs. There was plethora of idle funds in the markets and the investing public was ready to subscribe to the share capital in the hope of receiving high profits. The War had also contributed to the change of investor's psychology. War-surplus Dakotas were also available from the Disposals at such low prices as Rs. 20,000 for each aircraft and only about a lakh of Rupees were required for its conversion for commercial operations. Spare parts were also available in large quantities and at extraordinarily low prices. By early 1947, 21 Companies with an authorised capital of Rs. 42 crores were registered. The Controller of Capital issues, however, restricted the issue to Rs. 9.7 crores. Even before submitting their applications to the Air Transport Licensing Board most of the new airlines had equipped themselves with aircraft-spares and operating personnel. As there was a regular scramble for getting as many licences as possible, each applicant started building up an organisation which ultimately drained the capital resources of the company. By end of December, 1946, the Air Transport Licensing Board had received more than 95 applications from the 21 Companies in respect of 98 routes. By January, 1947, these applications for prospective routes had increased to 122. Most of these routes were never thought of in the post-war plans and had no ground organisation.

Ultimately, the Board granted provisional licences to 11 Companies between 1946 and 1948. The older companies like Air India (successors to Tata Air Lines), Indian National Airways and Air Services of India who were operating scheduled services in the pre-war period automatically obtained provisional licences in respect of most of their routes under Rule 147 of the Indian Aircraft Act. The new companies viz. Deccan Airways, Dalmia Jain Airways, Bharat Airways, Airways (India), Orient Airways, Mistri Airways, Ambica Airlines and the Jupiter Airways were granted provisional licences under Rule 146.

Then came the partition of India in August, 1947. It did not, however, seriously alter the pattern of air

routes in India except the loss of some of the remunerative routes by the Indian National Airways and the transfer of the activities by the Orient Airways to Pakistan.

DETERIORATION IN THE FINANCIAL POSITION OF THE AIRLINES

After the establishment of the Air Transport Licensing Board in 1946, eleven companies were thus licensed. Since then started the regime of un-economic competition which created series of difficulties in which the whole of the industry was engulfed.

The Board licensed too many operators when the potential traffic on many routes was very limited. The airlines on their part had grossly exaggerated the size of the transport market also. Although 30 to 40 Dakotas would have been sufficient to fly all the services licensed by the Board, about five times that number had been purchased by the airlines from the American Disposals with the result that the average rate of utilisation in 1948-49 fell to the low level of about 500 hours per year. It is a paradox that during this period traffic on the scheduled routes was gradually increasing. The average over-all load factor available during the years 1947-49 was much above 65 p.c. or much above the international load factor. The airlines were, therefore, not suffering so much from want of traffic as from high cost of operation. The airline management had obviously underestimated the cost of operation and had overestimated the demand for transportation. Throughout the early post-war period the airlines were unable to make the two ends meet though the traffic was steadily growing.

The difficulties of the airlines were accentuated by the state of inflation which was pushing up the cost of labour, fuel and the general administration. Reorganisation of the air route pattern to escape the deteriorating situation became impossible when the Licensing Board converted some of the provisional licences into 10 years term licences in July, 1949, and further granted licences

to two new comers in the field viz. the Kalinga Airlines and the Himalayan Airways in May, 1949 and October, 1949 respectively. The only relieving feature of this period was that the over-equipment of the airlines came in most useful in the work of evacuation of refugees from Pakistan to India in 1947 and subsequently in the operations in Kashmir. But for these operations which provided work for idle capacity of the Companies, some of the Companies would have got into financial embarrassment much earlier. The intrinsic position of the airline business was, however, going from bad to worse. Jupiter went into liquidation in October, 1948, and Ambica in February 1949. The airlines were struggling hard to make the two ends meet by reducing the fares. It was another paradox that while the Indian railways were increasing their fares during this period the Indian airlines were working in the opposite direction.

STATE ASSISTANCE TO THE AIR TRANSPORT INDUSTRY

The Government of India who were anxiously watching the critical situation assisted the airlines, by permitting an increase in fares. (1) The airlines got two such increases, one in December, 1947 and another one in April, 1948. (2) They further permitted the airlines in 1949, to increase the payload of the Dakota from 25,000 lbs. 26,200 lbs. for passenger service and 26,900 lbs. for freight service, thereby giving an additional payload of about half a ton to three-fourth of a ton which eventually increased the earning capacity of each aircraft. This relief was, however, of doubtful value to some of the operators as there was no traffic available for the increased capacity. (3) The third significant measure adopted to give relief to the airlines was the introduction of 'All-up' Mail Scheme started from 1st April, 1949. Under this scheme, the surcharge on the air-mail was abolished and all the domestic mail came to be transferred to air. But there was a change in the rate of remuneration which the airlines were to receive for the carriage of mail. Upto 31st March, 1949,

the rate fixed by the Licensing Board for internal services was Rs. 1-8-0 per lb. This was now revised and was fixed at 25 p.c. above the normal freight rate for the service by direct route and for air parcels at 25 p.c. less than the normal freight rate.

Though the payments to the airlines did not increase in the same proportion as the volume of mail, the all-up scheme did give some timely relief to the airlines. But, introduction of night air-mail scheme as a part of all-up scheme had reduced to certain extent the assistance that was expected by the airlines as bulk of the air mail came to be carried by the night air mail operator viz. the Himalayan Airways and later on by the Deccan Airways which is a state concern.

(4) The fourth measure was the partial rebate of customs duty on aviation fuel granted by the Government of India with effect from 1st March, 1949. The amount of this rebate was initially fixed at Rs. 0-6-0 per gallon but was subsequently increased to Rs. 0-9-0 per gallon. But this partial rebate did not give much relief to the airlines as the oil companies had in the meantime increased the price of the aviation fuel.

The price of fuel registered another advance in November, 1949 after the devaluation of the rupee. The net result of this situation was that the cost of fuel to the airlines after November, 1949, remained as it had been before 1st March, 1949. The Air Transport Inquiry Committee had observed that the system of subsidies granted since March 1st, 1949 on the basis of petrol consumed by an air transport company was not satisfactory as it did not take into account the need of each operator. For the period, October 1, 1950 to December 31, 1951, the Committee had recommended that the assistance should take the form of continuance of the petrol tax rebate of nine annas per gallon. The Committee further suggested that for 1952, the companies should get assistance in the form of fuel tax rebate to the reduced extent of six annas a gallon. The total annual rebate thus given would have amounted to Rs. 45 lakhs in 1951 and Rs. 30 lakhs in 1952. Since the Air Transport Inquiry Committee reported in 1950,

there has been further increase in prices of oil, petrol and the spare parts. In December, 1951, it was announced by the Government that the financial assistance to the airlines would be given in future on a new basis. Since the 1st March, 1949, the Government had been paying the subsidy to the air transport companies on the basis of the quantity of petrol used by them. This system had the obvious disadvantage of not being related to the needs of individual companies. In order to give financial help to those air transport companies which operate scheduled air transport services under efficient and economic management, a revised scheme for payment of subsidy was introduced with effect from the 1st October, 1951. This scheme provides for grant of subsidy to those companies which suffer a loss, the amount of the subsidy being the amount by which the actual revenue of the Company from all sources falls short of either the "standard cost" calculated by the Air Transport Inquiry Committee and revised from time to time by the Air Transport Licensing Board or the cost actually incurred, whichever cost is lower. A special payment equal to half the difference between the actual cost and the standard cost is made available to any company which succeeds in reducing its costs to a level below the standard cost. The latter is intended to encourage thrift and to bring down the cost of operation to an economic level. The total subsidy is subject to a ceiling calculated at 8 annas per gallon of petrol consumed by the operator, which was the rate of subsidy granted to operators of scheduled services for the period 1st April to 30th September, 1951.

Under the new scheme, companies not operating scheduled services are not entitled to any subsidy. Similarly, long distance services to the West and Far East are excluded from the scheme. It has also been stipulated that the grant of subsidy to any company will be subject to the condition that it maintains its accounts in the manner perscribed by the Government, allows its books and accounts to be inspected by its officers and agrees to carry out any specific recommendation made by the Government to ensure and improve efficiency and economy in the operation of its air trans-

port services.

The new scheme of subsidy made a departure from the scheme of financial assistance recommended by the Air Transport Inquiry Committee in 1950. While putting a premium on efficiency, it also secured greater state control on the working of the scheduled air services and their books of accounts. By excluding non-scheduled operators and the long distance air services to the foreign countries, the commitments of the state were also reduced. The scheme was however introduced when the operational costs were spiralling up on account of factors largely beyond the control of the air transport companies. The standard cost was calculated by the Air Transport Inquiry Committee in August, 1950. Since then, the price of the petrol alone had gone up by eight annas a gallon. With the constantly changing price of petrol between 1950-52, it was not possible for the airlines to work on a standard cost basis exclusively. The net result of the situation was that most of the companies were unable to make two ends meet and suffered heavy losses in 1950-52. It was this state of affairs which finally led to the plan of the Government for compulsory merger of all the internal airlines and setting up a single Corporation.

A SURVEY OF POST-WAR DEVELOPMENTS

Table No. 16* gives the operational statistics of the Indian airlines from 1939 to 1951. In 1938, milage of regular air routes was 6,700 and the Indian airlines had flown 1,412,334 miles and had carried 2,104 passengers and 244 tons of mails. In 1951, licensed route milage of Indian companies operating scheduled services was 32,354 miles. The airlines had flown 19,497,505 miles and had carried 449,462 passengers and more than 94,000,000 lbs. of air cargo. By the end of June, 1951, the number of aircraft registered in India was 738 and over 200 aircraft held current certificate of airworthiness. Though there has been thus a remarkable progress in civil aviation, it cannot be claimed as spectacular when

* See attached chart.

viewed against world perspective. As the standard of living in India improves coupled with efforts of the operators to keep the level of tariffs down to the minimum consistent with maintaining a healthy industry, so will more and more people use the services of the airlines.

The passenger traffic carried by the air transport companies shows certain characteristics. At present, it is largely confined to business executives, Government Officers, ordinary business travellers, tourists and emergency travellers. Penetration of airlines on the railway traffic has been negligible except on the long-haul routes like Bombay-Calcutta, Calcutta-Delhi and Bombay - Delhi. In general, the penetration increases rapidly with the length of the trip. The average length of journey on the domestic trips has been as follows:—

TABLE 17

Year	Average length of haul (Miles)
1947 ..	545
1948 ..	486
1949 ..	540
1950 ..	424

The number of passengers travelling by air normally attains a peak twice a year. The first is somewhere in May or June and the second in December - January. The traffic in May and June is normally higher than in December - January. The number of passengers reaches a minimum in July or August when the Indian Monsoon is well established. On an average more than one thousand passengers travel by air per day.

The remarkable growth of air travel in the post-war period may be attributed to the changed psychology of the travelling public, which had accepted air travel as the normal part of the Indian transportation system. The inflation money also assisted the business community during this period to travel by air. The most important long-range gain to commercial flying had been the actual experience gained by the Indian airlines in performing both the military and commercial war-time

task including acquisition of know-how in transportation of cargo. The war-released flying and ground personnel, newly established aerodromes, navigation facilities and increased safety and regularity during the war period had prepared the necessary background for the expansion of air transport services. At the same time the boom conditions in business created an impression that the demand for air travel was great. It was on this account, that some of the companies had built up large organisations with little regard to the actual magnitude of operations that could be handled. By the end of 1949, clear indications were available that there was not likely to be sufficient volume of traffic to sustain the operations of more than a very limited number of operating units as the combined losses of all the companies for the year amounted to Rs. 110 lakhs excluding the petrol rebate which amounted to approximately Rs. 37.8 lakhs. The striking deterioration in the financial position of the Indian airlines was due to the fundamental error in business judgement. The size of the total market was grossly exaggerated and the costs were seriously underestimated. Even though the total traffic increased from 1945 at quite an impressive rate, it is clear that the airline management over-estimated the demand. Besides, direct flying costs and all other operating costs were increasing at unanticipated rates. In the face of these unfavourable and rising costs and low utilisation trends, the Indian airlines were lowering their fares. The net result of this situation was that the airlines were operating with a deficit exceeding Rs. 1 crore per year and without adequate provision for depreciation. The financial difficulties which were continuously mounting since 1947 were no less due to the management and the Government being over-optimistic about the volume of post-war passenger and freight traffic.

Both as a result of keen competition and the failure of the traffic to expand to the expected level, there was a tendency to reduce fares, particularly after the introduction of the night air mail services. The failure of the travel market to support post-war expansion may be attributed to small number of remunerative routes,

limited number of large centres of population and of trade and industry and the low purchasing power of the travelling public. Summarising the defects and the difficulties of the airlines, the Air Transport Inquiry Committee have observed that the fundamental defect in the existing set-up of the industry has been that there are too many operators for the work to be done resulting in multiplication of overheads, increased costs, wasteful competition and reduced revenues. The difficulties of the airlines were also largely due to their equipping themselves with aircraft and spares and recruiting personnel on a scale far in excess of what was needed for the operation of the services which they could reasonably have expected to be allotted to them. This resulted in the capital resources of the companies being drained. The cost of aviation fuel which had been progressively going up since April, 1946 also contributed substantially to the high cost of operation in India.[1] The defects and difficulties as outlined above have continued to operate in 1951 and 1952. The Air Transport Inquiry Committee had suggested voluntary mergers and redistribution of the existing routes as a measure to escape the situation.[2] If the reorganisation scheme suggested by the Committee would have been accepted by the industry, it would have enabled the industry to operate on an economic basis and it would have been also easier for the Government to grant financial assistance to the industry under a new set of circumstances. While recognising that many factors have recently contributed to the increased cost of operation, it will have to be the endeavour of the airlines to bring down their costs in an orderly manner. This means both technical and economic rationalisation of the industry. Technical rationalisation will involve both reduction in the operating costs and re-equipment with current economic types of aircraft while economic rationalisation will involve highest possible utilisation of the aircraft which may enable the operators to spread overheads over a

1 Air Transport Inquiry Committee Report, Ch. 3, p. 60
2 *Ibid.* ch. 7, p. 116

large amount of productive work and reduction in the existing number of operators to about four with due considerations to geographical and zonal distribution. Any spectacular increase in traffic during the next five years cannot be expected. In fact, the decline in the load factor from 74.8 per cent in 1946 to 68 per cent in 1951 clearly discloses the lopsided growth in the traffic operations. The main problem for the airlines is not therefore the development of new routes. It is to increase frequency on the existing routes with an adequate load factor.

Though the passenger, mail and freight traffic has registered a gradual growth since 1945, the condition of the air transport industry has been gradually weakening. Since 1st March, 1949, the Government have been paying subsidy to air transport companies on the basis of quantity of petrol used by them. A revised scheme for payment of subsidy was introduced with effect from 1st October, 1951 with a view to encourage efficiency in the management of the companies. Inspite of these measures most of the companies except Airways (India) have incurred heavy losses. This situation has led the Government to reconsider the whole situation and if possible to nationalise air services in the immediate future.

The Government of India gave their first consideration to the problem of nationalisation in February, 1947, when a conference was convened by the Member for Communication. Most of the provincial governments appeared to be in favour of nationalisation, while the representatives of the industry expressed the view that the industry should be left to the private enterprise. As the Indian Government were pre-occupied with the political problems which culminated in the partition of the country in August, 1947, the matter was not pursued further. When the Government of India issued the Industrial Policy Resolution dated 6th April, 1948, it was proposed that the development of air transport should be left to private enterprise with planning and regulation of it by the Central Government. Similarly when 10 years term licences were issued to the airline operators in July, 1949, there appeared to be no intention

on the part of the Government to nationalise air transport. The Rajadhyaksha Committee on air transport very carefully considered the problem of nationalisation and concluded that there was no sufficient justification to break away from the existing set-up and that the matter should be reviewed at the end of five years. Should, however, Government decide as a matter of policy upon the state-ownership of air transport services, their operation should be entrusted to a Statutory Corporation.

But the decision of the air transport operators, as well as the civil aviation authorities, to have most of the present aircraft replaced at the earliest possible time, has brought to the forefront the issue of the nationalisation of air transport companies. A conference to consider the selection of modern transport aircraft was held at New Delhi on the 15th January, 1952. Besides the top executives of the airlines, the conference was attended by the representatives of the Planning Commission and the Ministry of Defence. It was decided by the conference that the stage had been reached when the air transport companies could not stay any further the question of replacement of the Dakota with newer types of planes, particularly in respect of trunk routes and the international services, though on subsidiary routes, Dakota could continue to be employed for some time. It was estimated that immediately 15 modern transport aircraft would have to be purchased to have the necessary replacement. It was suggested by the airline operators that the Government should advance two-thirds of the capital required, amounting to Rs. 3½ to Rs. 4 crores at a nominal rate of interest.

In view of the fact that the Government were giving the airlines an indirect subsidy to the extent of Rs. 30 to 40 lakhs every year and that inspite of this assistance the airlines were running at a loss, it was felt by the Government that it was not possible to advance a loan of Rs. 4 crores to the operators. The only solution therefore appeared to be to have a single operating unit under state control and with state aid.

On the basis of the discussion at the conference held

in January, 1952, and after further cousultation with the Government of India, the Planning Commission gave a very careful consideration to the problem. It appeared to the Commission that a situation had arisen when continued existence of most of the airlines becomes impossible and that the Government is left with no alternative to taking over the air transport industry. Merger of the existing scheduled operators into a single unit for the purpose of establishment of a Corporation was therefore recommended by the Planning Commission. The Commission has estimated that a new fleet of 20 aircraft would be required costing about ten crores of rupees. According to this estimate, two latest modern aircraft would be added to the Air India International for its western services and three D.C. 6 or some other type of similar size will be brought by the Bharat Airways for its eastern services. All this would mean an investment of Rs. 4.5 crores. For shorter international services and major trunk routes within the country, it was estimated that a fleet of 15 more aircraft should be bought at an approximate cost of six crores of rupees.

The Planning Commission has further proposed that under the scheme, shareholders of existing companies may be allowed to participate "pro rata" in exchange for their present holdings, while the Central Government's share in it will be large enough to exercise effective control over the network of air services.

On the basis of this estimate, the Communication Minister Mr. Jagjivan Ram held a series of consultations with air transport companies regarding the Government of India's scheme for the establishment of a Statutory Corporation.

In view of the deteriorating conditions in the air transport industry, nationalisaton of air services appears to be the correct move to ensure sound and healthy development of civil aviation in India. A unified organisation would be able to take full advantage of technical developments which are rapidly taking place in civil air transport equipment and operational technique. As the profit motive would not be predominant, the state organisation would be in a better position to

give efficient and cheaper services to the public. If India is to keep abreast of advancement in civil air transport additional capital outlay would be involved and the Government would be in better position to extend the necessary aid to the Statutory Corporation.

The economic rationalisation of air transport through compulsory merger of the existing civil air transport companies into a single unit may necessitate heavy reduction in technical staff, depriving the industry of services of a good number of technical experts who are bound to face unemployment. The technical rationalisation may result in the displacement of the Dakota aircraft by more superior and efficient modern aircraft. Air transport in India will have to be operated at the minimum possible cost and difficulties in the transitional stage will have to be faced. Compulsory rationalisation by merger is to be preferred to voluntary winding up of the companies which force of circumstances would bring about. Nationalisation through compulsory merger may enable the civil aviation in India to enter into a new era which may be marked by more rapid and healthy expansion of air services. Much will also depend upon the public support that the Indian air transport industry will be able to attract through their usefulness based largely upon the productivity and prosperity of India as evidenced by the level of national income.

CHAPTER VI

PRINCIPAL INDIAN AIRLINES

A brief sketch of the principal airlines in India operating the various air routes is necessary for an understanding of the development of air transport in the country.

AIR-INDIA LTD., BOMBAY

Air-India was registered on 29th July, 1946 with an authorised capital of Rs. 5 crores of which Rs. 1.5 crores have been issued and paid up. When formed, Air-India took over the Aviation Department of the Tata Sons, Limited, with all its equipment at a total purchase price of Rs. 39,46,116 which included Rs. 20,00,000 for the good-will. Tata Airlines, to which Air-India was successor, had made considerable progress between 1939-1945 as the result of war activities. The pre-war route milage of Tata Airlines was about 3697 miles and it had increased to 5951 miles in 1945 while the pre-war annual milage of 1,169,647 miles had increased to 2,102,630. The total traffic ton-miles had also increased from pre-war figure of 245,500 in 1939 to 4,483,000 in 1945. In view of this growth and the post-war prospects, Tata Sons, Ltd., decided to convert their Aviation Department into a public limited company. At the inception, Air-India took over from the Aviation Department, a fleet of 15 twin-engined aircraft, some of which were held on long lease from the American Government. After its formation, Air-India started operations on Bombay-Delhi, Bombay-Karachi, Bombay-Colombo and Bombay-Calcutta routes in 1946 and on the Madras-Bangalore-Cochin-Travancore route in January 1947. As successors to Tata Airlines, Air-India became entitled to the guaranteed minimum payment of Rs. 15 lakhs per annum under the agreement made in 1939. With the partition of India, the circumstances had

changed and from 1st July, 1948 the guaranteed minimum was reduced to Rs. 10 lakhs per annum. Air-India promoted in March, 1948, Air-India International for the operation of external services to the West of India and were appointed as Technical Managers and Principal Booking Agents of the new company for a period of ten years. Air-India also participated to the extent of 10 p.c. in the capital of the new Company.

By the end of the year 1950, the Company had a route milage of 5940 and a fleet of 15 Dakotas, 7 Vikings and 1 Expeditor.

The routes operated by the Company on the 1st February, 1952 were as follows:—

(1) Bombay-Calcutta, Daily, Viking,
(2) Bombay-Delhi, Daily, Viking,
(3) Bombay-Delhi (Night Service) Daily, Viking,
(4) Bombay-Ahmedabad-Karachi, Daily, Dakota,
(5) Bombay-Karachi, 2 Weekly, Viking,
(6) Bombay-Madras-Tiruchirappalli-Colombo, Daily, Dakota,
(7) Madras-Bangalore-Coimbatore-Cochin-Trivandrum, Daily, Dakota.

(See Table 18 on next page)

AIR-INDIA INTERNATIONAL LTD., BOMBAY

Air-India International was registered on 8th March, 1948, mainly for the purpose of operating external service from India to the West of India. The authorised capital of the Company is Rs. 7 crores of which Rs. 2 crores was issued and subscribed and paid up. Under an agreement dated 12th March, 1948, between the Government of India and Air-India International, the Government have taken up 49 p.c. of the share capital and further hold an option to acquire 2 p.c. more at any time. As the largest shareholder, the Government have effective control over the policy of the Company, thus safeguarding in full the national interest. At the same time, by entrusting the day to day management of the Company to a private enterprise the important objective of efficient manage-

TABLE 18

Particulars	Air-India International Limited			Air-India Limited		
	1948	1949	1950	1948	1949	1950
Plane Hours	1,518	5,424	8,064	27,000	29,000	33,400
Plane Miles	4,25,000	1,297,000	2,013,000	4,690,000	4,887,000	5,588,000
Revenue Passengers	2,690	7,980	12,270	119,000	116,000	115,000
Revenue Passenger Miles	12,224,680	34,853,000	48,497,000	71,827,000	65,911,000	66,202,000
Revenue Cargo (in lbs.)	86,200	425,000	674,000	5,214,000	6,219,000	24,194,000
Mails (in lbs.)	81,170	221,000	313,000	785,000	1,760,000	1,571,000
Revenue ton-miles	1,532,000	4,625,000	6,508,000	8,127,000	7,248,000	7,233,000
Profit/Loss (+) (—)	Rs. — 4,24,000	+ 9,28,500	+ 19,72,050	+ 1,01,710	+ 3,541	— 2,556

ment based upon commercial principles has been achieved.

The Government Directors on the Board of the Company possess fairly wide discretionary powers though these are confined mainly to non-technical sphere. The Government have also guaranteed the Company against losses of operation including depreciation and initial expenses, for a period of five years and they will, therefore, be liable to meet the losses in the first instance, subject to their being subsequently recouped from profits (if and when made) in accordance with the conditions laid down in the agreement. Under an agreement between the Company and Air-India, Ltd., the latter were appointed General Technical Managers of the new Company for a period of ten years with a management fee based on a sliding scale dependent on the milage flown. Air-India is in operational charge of the services of Air-India International and also work as their Booking Agents.

A fleet of three Lockheed Constellations models 749 aircraft was purchased by the Company in 1948. Prior to the delivery of the aircraft, a number of engineering and flying personnel were sent to the United States for inspection and training purposes. The Company's service from Bombay to London via Cairo and Geneva was inaugurated on June 8th, 1948.

The external service was started with an initial frequency of one return service per week. This was subsequently increased to four flights a week. Two of the external services to London start from Bombay while the remaning two start from Calcutta via Bombay. Since October, 1950, Calcutta was made a starting and terminal point of one of the external services so that West-bound passengers originating in Calcutta and East-bound passengers destined for that city should be able to fly the whole way on the Constellation service. Encouraged by the results in the initial years, the Company started expansion of its activities by planning a service to Nairobi. The Bombay-Nairobi service was inaugurated on the 21st January, 1950, and is now in regular operation once a week via Karachi and Aden.

Thus, with four services to Europe and one to East Africa, the Company with a fleet of four Constellation aircraft reached the practical limit of utilisation of its fleet. In December, 1952, the company further expanded its activities. New Delhi was made a terminal station from 1st December, 1952 for one of the four Constellation services on the India-U.K. route. Till then, the Company was operating four services a week between London and Bombay and two of these continued to Calcutta. In addition, Air-India International decided to operate its first tourist class service on the 3,324 mile Bombay-Nairobi route from 7th December, 1952 on an initial frequency of two flights a month, in addition to the weekly de luxe Constellation service now in operation. This tourist class service will be operated by a four-engined 59 seater DC-4 Skymaster. The present fare from Bombay to Nairobi is Rs. 1,214. The tourist fare will be Rs. 880 which represents a reduction of about 27 per cent.

The first year of the Company's operations indicated the need for additional finance and accordingly after consulting the Government, the Board of Directors authorised the issue of debentures upto an amount of Rs. 2 crores. It was proposed to issue Rupees one crore in the first instance. By August, 1950, the debentures redeemable in 1959 and bearing interest rate of 4 per cent per annum were issued to the extent of Rs. 59 lakhs of which Rs. 50 lakhs have been issued to the Imperial Bank of India as security for a Demand Cash Credit of an equivalent amount. To continue competing successfully on the India-U.K. route the Company now proposes to purchase two Super-Constellations to replace the existing fleet of Constellations with spare parts at a cost of Rs. 2 crores. In view of the present market position, it is considered unwise to issue additional capital by the Company for this purpose. The Company will be able to find about Rs. 1.5 crores from its own resources and the Government propose to advance the balance of Rs. 50 lakhs at 4.5 per cent interest, repayable over eight years in two equal instalments. Though the Company has made a small profit during the years 1949 and 1950, it has not

been able, so far, to declare any dividend mainly because it has to pay subsidies previously received from the Government. During the year 1950, the Company operated 159 scheduled return services on the Bombay-London route and 40 on the Bombay-Nairobi route, in addition to 2 non-scheduled single services and 11 charter services. On the basis of four weekly services to London and one to Nairobi and taking into account occasional non-scheduled flights and charters, the Company's fleet is being operated at an annual rate of about 3000 hours per aircraft or about 8½ hours per day throughout the year. This compares well with the utilisation of any other international airline in the world. In 1950, the Company's operations have shown a marked improvement with 109.03 lakhs capacity ton-miles flown compared with 66.69 lakhs ton-miles in the previous year. It is indeed very creditable that the Company should have earned in 1950 a net profit of Rs. 19.72 lakhs after making full provision for depreciation and should have paid Rs. 7.32 lakhs to the Central Government in accordance with the terms of the agreement with the Government against the amount of Rs. 19.79 lakhs advanced by the Government to meet the operating loss sustained by the Company during the first year of operations. The company has already repaid Rs. 2.1 lakhs to the Government out of the profits made during the year 1949.

INDIAN NATIONAL AIRWAYS LTD., NEW DELHI

The pre-war history of this ariline has been referred to in an earlier chapter. Throughout the war period (1939-1945), the whole of the Company's organisation continued to be under contract with the Government of India. The types of aircraft operated during the war period included Rapides, DC-2 B and the Dakotas. With the end of war in 1945, the Company decided to purchase 6 Vickers Vikings and 2 Bristol 'Wayfarer' aircraft of the freight-cum-passenger type. The Company also purchased some Dakotas from the American Liquidation Committee. By the end of the war, the company was operating a route milage of 5163. With the partition

of the country in August, 1947, a number of the routes of Indian National Airways which lay in Pakistan had to be given up by the company. As the result of this situation, it became necessary for the Government to revise the mail agreement made with the Company in 1938. Under the old agreement, the Company was receiving a guaranteed payment of Rs. 3.25 lakhs per annum. This was reduced to Rs. 1 lakh per annum in 1947. Besides operating the domestic routes, the Company has worked as General Agents and Handling Agents for different international operators including the Air France, Philippine Airlines, Braathens and K.L.M. By the end of 1950, the company had a paid-up capital of Rs. 88.71 lakhs, route milage of 3880 and a fleet of 11 Dakotas, 5 Vikings and 2 Beechcraft.

The routes operated by the Company on 1st February, 1952 were as follows:—

(1) Delhi-Lahore, Daily, Dakota,
(2) Calcutta-Delhi, Daily, Viking,
(3) Delhi-Jaipur-Jodhpur-Karachi, 5 Weekly, Dakota,
(4) Calcutta-Rangoon, 6 Weekly, Viking,
(5) Delhi-Amritsar-Jammu-Srinagar, Daily, Dakota.
(6) Calcutta-Muzaffarpur-Patna-Kathmandu, 5 Weekly, Dakota,
(7) Patna-Kathmandu, 5 Weekly, Dakota.

(See Table 19 on next page.)

AIR SERVICES OF INDIA LTD., BOMBAY

A brief history of Air Services of India which was incorporated in 1937 has been traced in the previous chapter. The scheduled services of the Company were closed in October, 1940, owing to the conditions created by the war and the Company's activities came to be centred in the development of the technical institute at Jamnagar which was utilised for training candidates for Air Force. Full control of this institute was assumed by the Government in September, 1943, and the Company was paid hire and depreciation charges on the equipment used. In January, 1944, the institution at

TABLE 19

INDIAN NATIONAL AIRWAYS LTD.

STATISTICS FOR THE FINANCIAL YEAR ENDED 30TH JUNE

Particulars	1947-48	1948-49	1949-50	1950-51
Flying hours	13,226-45	11,299-26	12,083-58	13,590-55
Milage flown	21,92,342	19,71,570	21,03,583	22,82,848
No. of passengers flown	66,828	48,659	53,693	57,177
Passenger-miles	335,78,216	2,56,84,739	2,48,47,013	2,72,45,444
Wt. of freight & * Excess baggage	lbs. 30,07,115-2	lbs. 21,72,971-8	lbs. 50,23,792-0	lbs.| 78,84,735,-9
Wt. of mails carried	lbs. 2,90,384,-1	lbs. 1,99,440-12	lbs. 7,57,685¼	lbs.| 6,27,213
Revenue per mile	Rs. 5.57	Rs. 4.78	Rs. 4.86	Rs. 4.47
Profit & Loss	(loss) Rs. 8,93,249|-	(loss) 11,72,686|-	(profit) 9,370|-	(loss) 3,835|-

* Including weight of Newspapers.

Jamnagar came to be entirely transferred to South East Asia Air Command. A notable change had taken place in 1943 when the Managing Agency of the Company was acquired by Messrs. Scindia Steam Navigation Comany. From that time onwards, repeated efforts were made to obtain permission from the Government of India to recommence operations. Considerable preparations had also been made in advance in collecting suitable aircraft and the necessary staff. For this purpose, the Company had purchased 10 Dakotas, 3 Rapides, and 2 small L-5 aircraft. Capital reorganisation was also undertaken with a view to expand company's activities. By March, 1945, the South East Asia Air Command had also redelivered to the company, the Machanical Training Centre at Jamnagar. From 3rd May, 1946, the Company restarted its activities by inaugurating its daily Bombay-Jamnagar-Bhuj service which was subsequently extended to Karachi in July, 1946. A new bi-weekly service was also started from 28th June, 1946 between Bombay and Lucknow via Indore, Bhopal and Kanpur. This service was however closed in August, 1947 as the traffic response was disappointing. A feeder service operated by Rapides was also started on the route Porbander-Jamnagar-Wankaner to support Company's main line and to serve those States in Kathiawad whose aerodromes were not large enough for Dakota aircraft. These operations too proved to be unremunerative. In April, 1947 a Dakota Service between Bombay and Delhi was started via Indore and Gwalior. When Ambica Airline went into liquidation in February, 1949, their Bombay-Rajkot-Morvi and Bombay-Poona-Bangalore routes were transferred to Air Services of India. To secure economic working of the short-routes, the Company purchased in 1949, two 10 seater modern aircraft of French manufacture known as SO.95 having a speed of 200 miles per hour and fully conforming to I.C.A.O. organisation's safety and performance requirements. The initial price of this aircraft was then about Rs. 5 lakhs. It was subsequently discovered that the aircraft was unsuitable for some of the routes of the Company and was withdrawn in October, 1950, in favour of Dakota. From 10th April,

1951 the Company also inaugurated a new service between Bombay-Cochin via Belgaum. By end of 1950, the paid up capital of the Company was Rs. 90.79 lakhs, a route milage of 2548, and a fleet of 8 Dakotas, 2 SO.95, 3 D.H. Rapide and other small aircraft.

The routes operated by the Company on 1st February, 1952 were as follows:—

(1) Bombay-Keshod-Porbander-Jamnagar-Bhuj, 5 Weekly, Dakota,
(2) Bombay-Jamnagar-Bhuj-Karachi, 2 Weekly, Dakota,
(3) Bombay-Bhavnagar-Rajkot, Daily, Dakota,
(4) Bombay-Poona-Belgaum-Bangalore, 1 Weekly, Dakota,
(5) Bombay-Poona-Bangalore, 1 Weekly, Dakota,
(6) Bombay-Cochin, 3 Weekly, Dakota,
(7) Bombay-Indore-Gwalior-Kanpur-Lucknow, 2 Weekly, Dakota.

(See Table 20 on next page.)

DECCAN AIRWAYS LTD., BEGUMPET (DECCAN)

The formation of the Deccan Airways has its seed in the Hyderabad State Aviation Club at Begumpet airfield. The Nizam's State Railways had also taken keen interest in the development of civil aviation and had formed as an additional branch of their railways and road network, the air transport service. When the World War II broke out, the Begumpet airfield together with all its hangars and personnel were taken over by the Government and were used for training purposes. Another large airfield was also constructed some 16 miles from Hyderabad to cope up with the growing traffic. After the end of the war, the Hyderabad State decided to enter the field of civil aviation. This led to the formation of the Deccan Airways which were incorporated on 21st September, 1945. The Hyderabad State contributed 71 p. c. of the paid up capital, the balance being held by the public and the Tata Sons, Ltd. By end of 1950, the

TABLE 20

AIR SERVICES OF INDIA, LTD.

Traffic Statistics in respect of Scheduled Services for the financial years 1948-49, 1949-50 and 1950-51 and the half year ended December, 1951.

Particulars	July, 1948 to June, 1949.	July, 1949 to June, 1950.	July, 1950 to June, 1951.	July,1951 to Dec. 1951.
Plane Hours (Revenue)	7,935-37	6,994-09	7,001-25	2,816-14
Plane Miles (Revenue)	11,37,142	10,36,082	10,22,900	4,04,917
Revenue passengers	57,040	42,771	41,863	16,593
Revenue Pass. Miles	153,45,186	1,17,19,877	115,24,602	49,49,374
Revenue cargo (including Ex. baggage freight, newspapers and Mail)	17,02,591	14,84,489	18,90,605	11,41,860
Revenue ton-miles	15,76,274	12,08,470	12,89,631	5,93,200
Profit and Loss	+4,05,241	—15,61,405	—9,87,514	

+Profit. —Loss.

Company had a paid up capital of Rs. 55.71 lakhs, a route milage of 1819 and a fleet of 15 Dakotas, one Leopord Moth and one Fairchild.

The Company commenced its operations with effect from 1st July, 1946 with a fleet of 4 Dakotas and one Rapide. From 1st July, 1946 a bi-weekly service was started on the Hyderabad-Bangalore route and another one on the Madras-Delhi route via Hyderabad, Nagpur, Bhopal and Gwalior. During the initial years, the Company also operated charter flights to Jeddah (in Saudi-Arabia), Cairo and Rome. With effect from 10th February, 1947, the Company established a service between Hyderabad and Bombay. The Hyderabad-Bangalore service now found a new link with Bombay, as passengers from Bangalore got the much needed connection with Bombay via Hyderabad. From 2nd July, 1948 to 14th October, 1948, all the activities of the Company were suspended on account of the Police Action in the Hyderabad State. The operations were once again resumed from 15th October, 1948. In 1949, the Company operated as an experimental measure three feeder routes viz. (1) Hyderabad-Vijayawada-Visakhapatanam, (2) Vijayawada-Madras and (3) Madras-Thiruchirappalli-Madhurai. The Dakota operations on these routes proved, however, to be unremunerative. On April, 25th, 1951, the Standing Advisory Committee attached to the Ministry of Communications approved of the nationalisation of the Deccan Airways. The Union Government decided to acquire the shares and rights of the Government of Hyderabad in the Deccan Airways on payment of Rs. 15.5 lakhs and to grant a loan of Rs. 23.5 lakhs to the company to enable it to discharge its loans with other creditors and to provide it with working capital. The Company is now managed by a Board of six Directors three of whom, including the Chairman, are nominees of the Government. From 1st June, 1951, the work of carrying the night mail was entrusted to the Company. In November, 1952, the Company inaugurated its Bombay - Aurangabad service which is operated thrice a week. The service brings the Ajanta and Ellora caves within easy reach of tourists from Bombay.

On 1st February, 1952, the Company was operating the following routes:-

(1) Madras-Hyderabad-Nagpur-Delhi, Daily, Dakota,
(2) Hyderabad-Bangalore, Daily, Dakota,
(3) Hyderabad-Bombay, Daily, Dakota,
(4) Delhi-Nagpur-Madras } Night Air Mail, Daily,
(5) Bombay-Nagpur-Calcutta } Dakota.

TABLE 21

Revenue Figures Only.

Particulars.	1948	1949	1950	1951
Plane Hours.	7,481	10,691	9,428	14,359
Plane Miles.	1,153,816	1,622,332	1,477,044	2,256,390
Passengers (Nos.)	28,942	37,830	34,060	53,582
Passenger Miles.	14,382,242	17,582,437	15,570,104	27,907,039
Cargo (including excess of baggage, newspapers, freight and mails) lbs.	101,028	1,719,460	3,128,316	4,588,897
Revenue Ton-miles	1,543,343	1,941,439	1,939,552	3,630,618
Profit (+) or loss (—) Rs.	+45,852	—1,974,204	—1,570,246	Not yet available.

NOTE:— The figures for 1951 include those of Night Mail Services from 1st June, 1951.

AIRWAYS (INDIA) LTD., CALCUTTA

This Company was incorporated in September, 1945. In the initial period, the Company started its non-scheduled operations with only three Dakotas. Before commencing the scheduled services, the Company was carrying on charter flights to Burma and incidentally it was the first Indian operator to conduct commercial flights to post-war Burma. The first scheduled service of this company was on Calcutta - Bangalore sector via

Bhubaneshwar, Visakhapatnam and Madras with three return services a week at the beginning, covering an unduplicated route milage of 1055 only. Within four years, Airways India increased their unduplicated route milage to 3061, serving five sectors viz. Calcutta-Bombay, Calcutta - Bangalore, Calcutta - Bagdgora, Calcutta - Dacca and Calcutta - Gauhati - Dibrugarh. It also introduced in December, 1951 its "Airist" class service between Gauhati and Delhi, thus adding 978 miles to its coverage. The "Airist" class service aims at air travel at cheap rates by cutting out the luxuries while still retaining the normal standards and operational efficiency.

The most notable of the experiments initiated by Airways (India) was the air - linking of Calcutta and the eastern portion of India. When the surface transport facilities in Eastern India were suddenly snapped in late 1947, Airways India was called upon by the Government of India to airlift mails and also passengers between Calcutta and North Bengal districts, Gauhati, Silchar, Tezpur, Dibrugarh and Agartala. As a result of its successful operations during the emergency, Airways (India) was granted a licence on Calcutta - Bagdgora and Calcutta - Mohanbari sectors in February, 1949. Airways (India) also did pioneering work in introducing scheduled freight service, family and week-end concessions, and coach type of air service in India.

On 1st February, 1952, Airways (India) was operating the following routes:—

1. Calcutta - Visakhapatnam - Madras - Bangalore, 4 weekly, Dakota,
2. Calcutta - Bhubaneswar - Madras - Bangalore, 3 weekly, Dakota,
3. Calcutta - Dacca, 3 daily, Dakota,
4. Calcutta - Gauhati - Mohanbari, Daily, Dakota.
5. Calcutta - Gauhati - Mohanbari (freight service), 1 weekly, Dakota.
6. Calcutta - Gauhati, 2 daily, Dakota.

The striking growth of Airways (India) may be mainly attributed to the vision and endeavour of its

Managing Director Mr. K. K. Roy. The Company has a paid up capital of Rs. 21.44 lakhs, and has a fleet of 14 Dakotas and 2 Dones.

TABLE 22

OPERATIONAL STATISTICS.

Particulars.	1947	1948	1949	1950
Plane Hours.	3,367	8,476	12,774	24,815
Plane Miles.	5,04,711	13,14,939	18,40,099	36,00,415
Revenue Passengers.	9,910	31,476	48,639	1,02,646
Revenue Pax-miles	48,80,853	134,21,339	174,66,634	307,00,961
Revenue Cargo (incl. ft. excess bag. and news-papers in lbs.	3,30,343	13,91,085	33,24,701	240,81,048
Mail in lbs.	27,092	3,42,695	5,36,648	17,45,208
Revenue ton-miles.	5,18,254	15,18,874	21,41,820	60,30,351
Capacity ton-miles.	9,46,766	25,18,905	40,53,208	93,01,266

BHARAT AIRWAYS LTD., CALCUTTA

Bharat Airways was incorporated on August 11th, 1945. Non-scheduled operations were initially undertaken in January, 1947. From 30th June, 1947, the Company was provisionally licensed to operate a thrice weekly service on the Calcutta - Gaya - Lucknow route. Subsequently from 21st October, 1947, a licence was granted to operate a service between Calcutta and Delhi via Allahabad and Kanpur with a frequency of 4 services a week. From 27th October, 1947, a scheduled service between Delhi and Amritsar was started but was subsequently closed in March, 1948, as it proved to be unremunerative. For the same reasons, an afternoon shuttle-service between Delhi and Lucknow started in

October, 1947, was closed in January, 1948. In June, 1948, a daily service was established between Calcutta and - Chittagong. By middle of 1949, a service between Calcutta and Agartala was also started. By December, 1949, Agartala was also linked with Gauhati by a daily service.

Bharat Airways had purchased three Skymasters by middle of 1948 with a view to operate an external service to the East. Technical personnel was also sent to U.S.A. for the necessary training. A fortnightly service between Calcutta and Hongkong via Saigon and Bangkok was started from 25th May, 1949. As the response was inadequate, the service was subsequently restricted to Bangkok only. Later on in October, 1950, the Calcutta-Bangkok service was extended to Singapore with a weekly frequency. Early in 1951, the Government of India also sanctioned a provisional payment to Bharat of Rs. 2,00,000/- to be adjusted against the subsidy, not exceeding Rs. 6,00,000/- proposed to be granted to the company towards meeting its losses in respect of the first year of operation of the Calcutta - Bangkok - Singapore air service. Besides scheduled operations, Bharat has also done considerable charter work to U.K., Ceylon and Australia. Bharat is not still a member of I.A.T.A. and has the freedom to charge its own rates on the external routes. By end of 1950, the Company had a paid up capital of Rs. 80 lakhs, a route milage of 3,233 and a fleet of 13 Dakotas, 2 Skymasters, 1 Bristol Wayfarer and 3 small aircraft.

On 1st February, 1952, Bharat was operating the following routes:—

(1) Calcutta - Bangkok - Singapore, 1 Weekly, Skymaster.
(2) Calcutta - Patna - Banaras - Lucknow - Delhi, Daily, Dakota.
(3) Calcutta - Chittagong, Daily, Dakota.
(4) Calcutta - Agartala - Silchar - Imphal, Daily, Dakota.
(5) Calcutta - Agartala, 13 Weekly, Dakota.

(6) Calcutta - Agartala (Freight Service only) 3 to 6 daily, Skymaster.
(7) Agartala - Gauhati, 2 Weekly, Dakota.
(8) Agartala - Gauhati - Tezpur - Jorhat - Mohanbari, Daily, Dakota.
(9) Calcutta - Ranchi - Patna, 2 Weekly, Dakota.
(10) Gauhati - Silchar, 2 Weekly, Dakota.

TABLE 23

OPERATIONAL STATISTIES

	Year 1949	Year 1950	Year 1951
Route miles flown	1,337,874	2,453,668	2,404,720
No. of Revenue Passengers carried.	34,675	84,369	70,631
Revenue passenger-miles flown	1,131,044	21,544,019	2,289,556
Cargo tons carried	2,090	11,592	9,650
Mail tons carried.	183	249	331
REVENUE TON-MILES CARRIED.			
Passengers.	987,884	1,917,621	2,064,367
Cargo	486,581	2,434,230	2,188,267
Mail	87,172	106,925	135,671
TOTAL:—	1,561,637	4,458,776	4,388,305
Capacity ton-miles operated.	3,466,348	7,636,338	7,358,555
Revenue load factor	45.03%	59.32%	59.64%
Unduplicated route milage.	3230	4571	3849

HIMALAYAN AVIATION LTD., CALCUTTA

This company was formed in 1947 as a private limited company primarily to undertake the work of air survey and non-scheduled services. Initially, the company started its operations with 11 Dakotas, 11 Pilots and 5 Radio Officers. In September, 1949 the Company made an offer to the Government of India to

operate Night Air Mail Service without any conditions in regard to guarantee of revenues. After negotiations with other airlines, Air Transport Licensing Board granted a provisional licence to the Himalayan Aviation for a period of 3 months. Within 15 days of the grant of the licence, the Himalayan Aviation started operations. Between 15th October, 1949 and January, 1950, the Company expanded its organisation and established a good record for operational efficiency. The Company was also able to develop a good passenger and freight traffic, the passenger fares being fixed at the first class railway fares plus 12½. During this period, the Company also developed considerable non-scheduled traffic. The provisional licence of the Company was renewed in January, 1950 and thereafter for a further period of one year upto 31st January, 1951. From 1st June, 1950, the work connected with the night mails was transferred to the Deccan Airways. In December, 1951, Himalayan Aviation started an external service between Ahmedabad and Kabul. The external service is now operated from Bombay once a week and shows reasonable chances of success in the near future. By end of 1950, the Company had a paid up capital of Rs. 5 lakhs, a fleet of 7 Dakotas and 2 smaller aircraft and a route milage of 2132. On 1st Febraury 1952, the company operated the following routes:—

1. Calcutta - Allahabad - Bhopal - Ahmedabad, 1 weekly, Dakota,
2. Ahmedabad - Jamnagar - Zahidan - Kandahar - Kabul, Weekly, Dakota.

INDIAN OVERSEAS AIRLINES, LTD., BOMBAY

This company was a successor to Mistri Airways and was registered on 13th January, 1946. The Company obtained a provisional licence to operate Bombay - Nagpur - Calcutta route with effect from 29th September, 1946. The frequency of this service was increased subsequently and from March, 1947, it was put on a daily basis. During the Police Action in the Hyderabad State in 1948, the Company was provisionally granted permis-

sion to operate on the Nagpur - Hyderabad - Madras - Bangalore route. Between 20th February and 15th December, 1948, the Company was provisionally licensed to operate Nagpur - Jubbulpore - Allahabad - Kanpur - Lucknow route. None of these routes proved to be remunerative. In January, 1949, the Company got Night Air Mail licence. In May, 1949, the Company got into difficulties and suspended the night mail operations in June, 1949. The Company succeeded once again in getting the Night Air Mail licence which was granted in October, 1949. Owing to the increasing difficulties, the Company was compelled to suspend its operations in October, 1950. With a paid up capital of Rs. 1,20,00,000, and a fleet of 15 Dakotas, 1 Skymaster and number of small other aircraft, the Company failed on account of inadequate route milage (1037) and the low utilisation of the flying equipment.

AMBICA AIRLINE, LTD., BOMBAY

This Company was formed with a paid up capital of Rs. 26 lakhs and commenced operations from 27th January, 1947 on the Bombay - Rajkot - Morvi and Bombay - Poona - Bangalore routes. The Company also operated in 1948, a service between Bombay and Amritsar via Ahmedabad and Jodhpur. The load factor on all these routes proved to be uneconomically low and due to progressively deteriorating financial condition, the company went into liquidation.

JUPITER AIRWAYS, LTD., BOMBAY

This was the third Company which had to go into liquidation in the post-war period. Jupiter was formed in 1948 with a subscribed capital of Rs. 25,74,622. It was licensed to operate a tri-weekly service from Madras to Delhi via Visakhapatnam and Nagpur. This licence was subsequently revoked by the Air Transport Licencing Board for general incompetency to continue operations of scheduled services. An order to wind up the affairs of the Company was made by the Bombay High Court in the first week of February, 1949.

CHAPTER VII

AIRLINE FINANCE, ORGANISATION, PERSONNEL

(1) AIRLINE FINANCE

Different forms of transport show marked differences in their capital requirements. In the railway transportation, the form of organisation which most suits the requirements is the joint stock company organisation. In the railway transportation, the initial investment has to be on a large scale and the capital must be marshalled from many sources. Railways, therefore, offer different types of securities to the numerous class of investors. Railways have also largely depended upon debenture capital with fixed charges, for financing their expansion. On account of their excessive heavy investment in relation to the volume of business, the railway concerns relatively show a low ratio of revenue to the investment. The ocean carriers similarly require a heavy capital investment, but unlike the railways, the investment is largely confined to the steamers. Even in the steamship business, the form of organisation has been on the lines of railway companies and from time to time state help has been necessary to raise the necessary capital. But unlike the railways, shipping business has depended principally on ordinary shares, debenture capital playing relatively a minor part in the capital structure. In the road transport, the way is provided by the state and a small capital enables an individual proprietor or a partnership organisation to operate the motor services. Increased frequency may, however, necessitate, purchase of more equipment and mechanical facilities, ultimately compelling the organisers to adopt a joint stock company form of organisation. Because of their smaller capital investment, motor transport companies are able to show highest ratio of revenue to investment. In air transportation, the state provides the airports, navigation and

communication aids, the passenger-terminal buildings and the supply of weather information. All these essential aids are provided at the public cost. The airlines have, therefore, to provide themselves with funds for purchasing aircraft, maintenance facilities and soliciting and handling passenger, mail and freight business. In the early years of civil aviation, individual proprietorship and partnership forms of organisation brought air transport into existence. In those days, the operating units were smaller and the capital requirements were also limited. Even in the modern times, this type of organisation prevails in the field of non-scheduled operations. The trend towards larger unit has however become marked even in this class of business necessitating a larger organisation and larger capital needs.

Before the Second World War, Tata Airlines were promoted by Tata Sons, Ltd. as a private concern. Indian National Airways and the Air Services of India which were promoted as joint stock companies had to face considerable difficulties in marketing their securities. The Managing Agents who brought air transport into existence largely subscribed to the share capital and also provided from time to time finance required for other purposes. As air transport was considered a speculative business neither the investors nor the commercial banks were willing to help the Managing Agents in their work of expansion. On the other hand, mature and relatively more stable industries were able to obtain funds during the pre-war period without much difficulty. The airlines were, therefore, waging a continuous battle against heavy odds. When the Second World War started in 1939, the airlines had exclusive contracts with the Government of India which brought them substantial profits. When the war ended, it had changed the psychology of the investors. The capital markets in India were now ready to recognise the status of the air transport industry. In the post-war boom period, a large number of financiers started airline companies and the public readily subscribed to the share capital. The financial structure of these airlines largely rested upon public subscription for ordinary shares. Though Dakota aircraft was available

at cheap prices from the Disposals Department, most of the airlines started operations without adequate initial or working capital. When the post-war boom had spent its force by 1949, the Indian airlines got into difficulties and there was a crash in the airline securities. In fact, the airlines were showing heavy losses since 1947 and the Government of India had to assist the airlines in 1949 by refunding to them nine annas out of the fifteen annas of petrol tax paid on every gallon of petrol consumed. Though this measure gave some relief to the airlines, it did not save the situation. Since the date when the rebate was given, petrol prices had gone up by over nine annas per gallon that is equivalent to the value of the rebate. In order to assist the airlines, the Air Transport Inquiry Committee recommended continuation of the period of rebate at nine annas per gallon till October, 1951 and at six annas per gallon upto 1952. Subsequently the Government discontinued the rebate of six annas per gallon as from September 30, 1951 and decided to make up the difference between the revenue earned and the cost of operation reduced to a standard cost as laid down by the Air Transport Inquiry Committee. Thus with a history of heavy losses, the airlines are not in a position to replace Dakota or Viking aircraft by more modern machines.

The airlines in India have relatively a simple capital structure. Most of the airlines have issued ordinary shares of the denomination varying from Rs. 10 to Rs. 15. Air-India, Air-India International and Bharat Airways have, however, issued ordinary shares of the denomination of Rs. 100/-. Equity proceeds have been largely used both for the purchase of equipment and for providing the working capital. Use of preference shares has been made only to a small extent. The Indian Overseas Airlines (now defunct) had issued Redeemable Preference Shares of Rs. 500/- while the Indian National Airways have issued six per cent Preference Shares. Both these companies have also issued founders' shares. Of all the companies, Air-India International alone made use of four per cent debenture capital. The company had resolved in 1949 to issue debentures upto an amount

of Rs. 2 crores. It had issued debentures worth Rs. 50 lakhs for subscription by the public but got a poor response, as only debentures of the value of Rs. 7 lakhs were subscribed by two limited corporations. In August, 1950, the company had issued debentures of the value of Rs. 59,04,000 of which 50 lakhs had been issued to the Imperial Bank of India as security for a Demand Cash Credit of equivalent amount. The use of debenture capital on a large scale is prevented by the special nature of the assets that the airlines possess. Capital equipment of an airline may be useful for particular routes but may prove unsuitable on others. The re-sale value of such assets is therefore limited. Perhaps the greatest obstacle in the way of issuing debentures has been the rapid changes in the aircraft technology which make long-term securities unacceptable to the investors. Airlines have still to reach the stage of maturity attained by railway and shipping business. Thus, turbine and jet which have recently appeared in the picture have revolutionised air transport industry making the current equipment obsolete. The investors, therefore, feel that the industry is changing too fast to permit safe investment. This factor therefore explains the need of state assistance in the airline business. The finance for the capital investment has been the most pressing problem for the Indian airlines. The National Planning Commission which issued their First Five Year Plan in 1951 have observed that it would be necessary for the operating companies to replace Dakotas and Vikings by more modern machines before the end of the planning period. They have accordingly suggested an allotment of about Rs. 185 lakhs per annum for the civil aviation for the first two years. This is made of about Rs. 150 lakhs for the works and the rest for the equipment. For the second period of three years, the total allotment is about Rs. 967 lakhs. Besides, replacement of Dakotas and Vikings on the internal routes, it may also become necessary for Air-India International which is already utilising Constellations, to go in for jet or other more modern types of aircraft. The Planning Commission have estimated the additional capital expenditure necessary for such replacement at Rs. 5 crores. In order

to assist companies to replace their fleet, the Commission has urged assistance either in the form of interest bearing loans or through Government participation in the share capital of the concerns or through any other suitable method. The Standing Finance Committee of the Communications Ministry accordingly recommended in February, 1952 that a loan of Rs. 50 lakhs to Air-India International be sanctioned for the purchase of the latest type of aircraft. To continue competing successfully on the India-U.K. trunk air route, Air-India International proposes to acquire two Super-Constellations, with spare parts, at a cost of Rs. 2 crores. The company will be able to find about Rs. 1.5 crores from its own resources and the Government proposes to advance the balance of Rs. 50 lakhs at 4.5 per cent interest, repayable over eight years in two equal instalments. On January 15th, 1952, the D.G.C.A. held a conference of airline operators to decide if a new type of aircraft could be introduced on the internal routes. It is understood that either Viscount which may cost about Rs. 31.5 lakhs or Convair 340 which may cost about Rs. 28.5 lakhs may be selected for replacement. About 15 such aircrafts may be required and a large part of the initial capital for this replacement will have to be provided for by the Government.

The commercial banks in India have to a limited extent supplied the short-term or interim finance to the airlines. As these banks obtain their funds on a demand deposit basis, it is only logical that their investments be made so as to conform to the pattern of their liabilities. Most of the short-term advances to the airlines have been granted largely on the credit-standing of the Managing Agents.

Earnings as a source of capital for expansion is out of consideration. Most of the airlines have suffered heavy losses and adequate depreciation has not been provided with the result that no funds are likely to be available for replacement. For the future expansion, funds are not also likely to be available from the capital market as the past experience of the investors has been very bitter. If, however, in-

vestors feel that the Government is serious in putting the industry on a sound basis, it may be possible to raise the necessary capital. Once the industry has been put on stable foundations, it will be the duty of the industry to depend increasingly on its internal resources for future requirements. When confidence is thus established in the future of air transport, markets too may be more favourable to absorb the airline securities. Commercial banks and institutional investors may also make their contribution for assisting the industry in capital financing programme.

If, however, the airlines are unable to raise the necessary capital from the public, the Government will have to supply the necessary finance. Government control in proportion to the capital paid by the Government will be also inevitable. Either the Government will have to supply the needed finance with the necessary strings for control or they will have to take over the industry and operate it directly as a utility service as in the case of railways and road services. The Government of India have now under active examination legislation to bring about compulsory merger of all the existing internal airlines and setting up a single corporation to run India's domestic services. Nationalisation or compulsory amalgamation would inevitably lead to more closer control of the capital requirements of civil aviation.

(See Table 24 on next page)

(2) AIRLINE ORGANISATION

In the early years of civil aviation, airlines were promoted by individuals, partnerships or private limited concerns. Aircraft was then simple and relatively cheap and the capital needs were very limited. With the growth of air transport and introduction of larger and expensive aircraft, corporate form of organisation was largely adopted by the airlines. Before the last World War, Tata Airlines were a private concern while Air Services of India and the Indian National Airways were registered as public limited companies. The organisa-

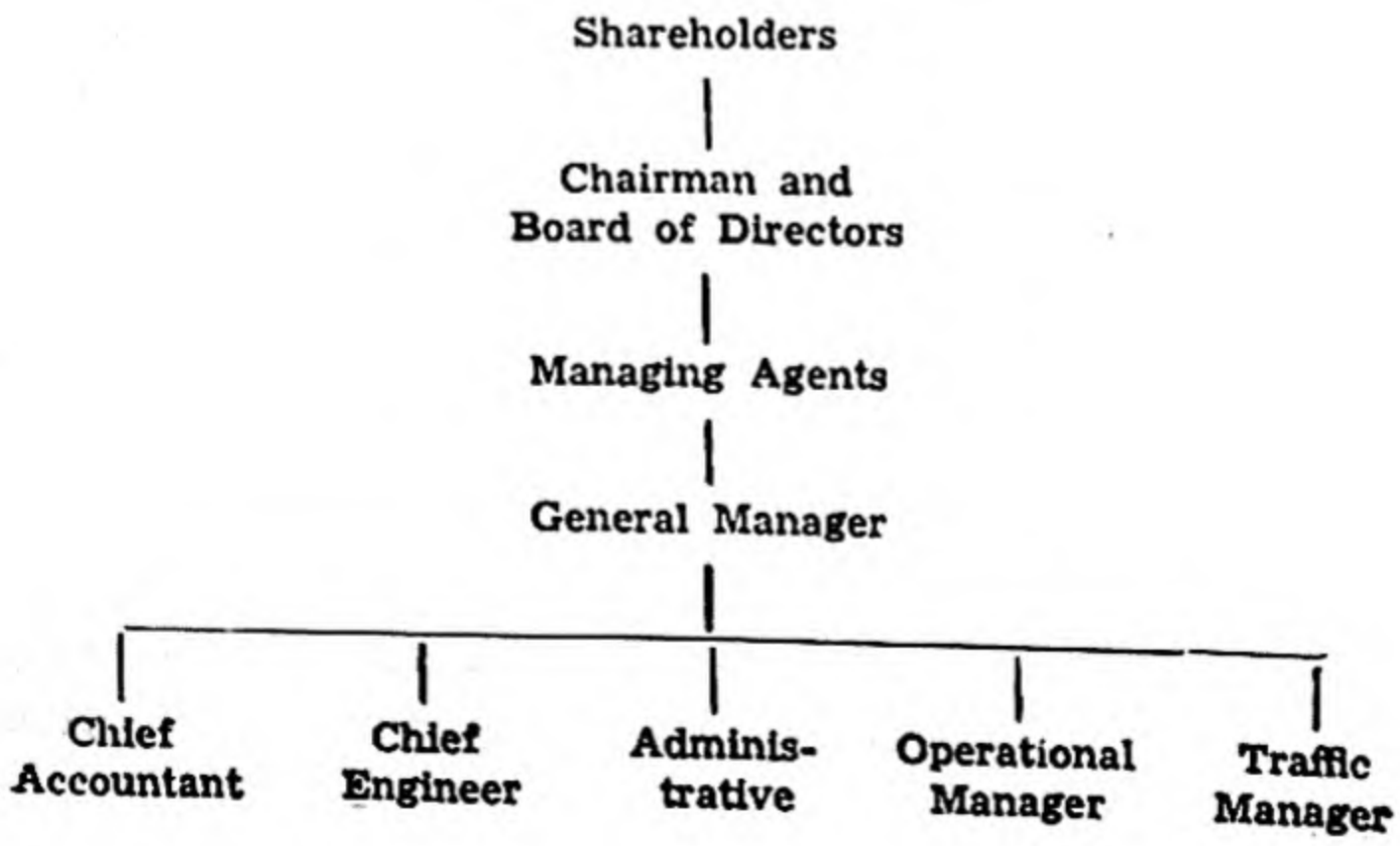
TABLE 24

The Paid up Capital of the Indian Airlines and Its Distribution March, 1950

Name of the Company and number of shares.	Paid Up Capital.	Face value of each share.
1. Air-India, Ltd.	Rs. 1,49,95,000	Rs. 100 each.
Ord. 1,50,000		
2. Bharat Airways, Ltd.	80,00,000	
Pref. 30,000		100 each.
Ord. 500,000		10 each.
3. Indian National Airways, Ltd.	88,54,000	
Pref. 50,000		10 each.
Ord. 837,500		10 each.
Less 14,800		
822,700		
Def. 125,000		1 each.
4. Airways, (India) Ltd.		
Ord. 239,014	21,28,000	10 each.
Less 26,212		
212,802		
5. Air Services of India, Ltd.	90,79,000	15 each.
Ord. 605,271		
6. Deccan Airways, Ltd.	55,71,000	10 each.
7. Himalayan Aviation, Ltd.	9,65,000	10 each.
Ord. 96,500		
8. Kalinga Airlines	25,00,000	Private concern.
9. Indian Overseas Airlines, Ltd.	79,83,000	
Pref. 3,200		500 each.
Ord. 61,000		100 each.
Founder 6,000		50 each.
10. Air-India International, Ltd.	2,00,00,000	
Ord. 2,00,000	Rs. 98 lakhs have been subscribed by the Government	100 each.
Total Paid up Capital	8,00,75,000	

tions of these three companies were largely built up upon the personalities who brought these airlines into existence. In the post-war period, most of the airlines promoted were public companies. But one of the scheduled operators, viz. Himalayan Aviation Ltd. is a private limited concern.

Perhaps on account of the youthful character of the industry and its recent growth in India, problems of organisation did not receive serious attention. Even now, the Indian airlines are experimenting with organisational policies and some kind of stability may be achieved in the near future. The aircraft has now become highly complex and the organisational set-up of airlines has also become highly technical. A high degree of economic and technical co-ordination is therefore required within a single company. The specialised activities of each department within the organisation of a company have to be integrated into one smoothly functioning unit which requires managerial ability of a very high order. The organisational set-up of Indian airlines is not therefore uniform, the major differences being due to the size, operating characteristics, volume of traffic, character of routes and the economic resources. But the common organisational pattern is outlined below:—



Each of these officers is a departmental head. The Accounts, Engineering, Administrative, Operational and Traffic departments, are usually subdivided into different sections, each under a senior officer. The duties and functions of each departmental head are as below:—

(1) *The Chairman and the Board of Directors*

As the representatives of the shareholders, the Board of Directors are responsible for the formulation of the company policy and supervision of the Managing Agents.

(2) *The Managing Agents*

The Agents work as Secretaries and Treasurers and are responsible to the Board of Directors. Majority of the Indian airlines are managed by the Managing Agents. The following is the list of Agency Houses which work in the airline business:—

Managing Agents.	*Operator.*
1. M/s. Tata Industries, Ltd.	Air-India, Ltd.
2. M/s. Tata Industries, Ltd.	Air-India International, Ltd.
3. M/s. Mercantile Airways Agency, Ltd.	Air Services of India, Ltd.
4. M/s. Govan Bros., Ltd.	Indian National Airways, Ltd.
5. M/s. Birla Brothers, Ltd.	Bharat Airways, Ltd.
6. M/s. Air Transport, Ltd.	Airways (India) Ltd.
7. M/s. Akhaney and Sons, Ltd.	Indian Overseas Airlines, Ltd.

Out of the remaining two scheduled operators, Himalayan Aviation Ltd., is a private limited company and is managed by two Directors, while Kalinga Airlines is the only privately owned airline.

The Managing Agents receive a certain percentage of commission by way of remuneration for their services. The commission to which the principal Managing Agents are entitled under their respective agreements is given below:-

	Name of the Company.	*Commission due to Managing Agents under the Agency Agreement.*
1.	Air-India, Limited.	7.1/2 p.c. on net profits.
2.	Air Services of India, Ltd.	12.1/2 —do—
3.	Indian National Airways Ltd.	10 —do—
4.	Bharat Airways, Ltd.	10 —do—
5.	Airways, (India) Ltd.	10 —do—

Besides a certain percentage of profits, the Agents also receive a monthly office allowance. The agents under the usual agency terms are entitled to the management and are responsible for the conduct of the affairs of the company subject to the control of the Board of Directors. In addition, the Agents are also entitled to such sums of money as may from time to time be advanced by them to the Company together with the agreed interest.

(3) THE GENERAL MANAGER

The General Manager is responsible to the Managing Agents. He exercises supervision over the various departments and co-ordinates their activities. The administrative department of which he is the head is divided into different sections like the administrative, store purchase, statistics, legal and personnel, each under a Senior Officer. The General Manager is not essentally an aviation expert in which case he is advised by the technical officers who are the heads of the various departments. Weekly or monthly staff meetings composed of the heads of departments are usually called by the General Manager. This conference method enables the General Manager to keep himself in touch with what has been done in each department and what is going to be done before the next meeting. The General Manager also gets daily reports about the traffic handled and the schedules maintained at each station. With the exception of few airlines, the General Managers have been recruited from the technical personnel.

The statistical section is responsible for recording and reporting of operating and traffic statistics for the compilation of the monthly returns, data about aircraft hours, aircraft utilisation, aircraft-miles, ton-miles, seat-miles, load factor, revenue returns under each head of traffic etc. to enable the General Manager and the heads of the various departments to watch the monthly progress and to keep themselves appraised of the success of the business policy.

The legal section of an airlines has a growing business and is engaged in several types of work. The airlines are, nowadays, subject to increasing control of the state which necessitates preparation of briefs. The section, besides handling all legal affairs, advises the General Manager regarding compliance with laws and regulations of the government. It also prepares the drafts of various contracts and agreements and maintains close contact with the legal advisers.

The stores purchase section under the direct supervision of the General Manager receives material from the various sources and despatches it to various places under despatch notes. It also stores materials supplied by approved dealers and declared serviceable by the Chief Inspector. In large-sized companies, stores purchase section is given a departmental status in view of the large amount of specialised material which is required by the airlines.

The Chief Accountant

Where the accounts receive a departmental status, the Chief Accountant is responsible for the administration of all company accounts, and disbursement of funds. He is also responsible for internal financial control. The Chief Accountant has usually no control over station accounts. There is usually a flow of correspondence between the Chief Accountant and the Station Accountant, but the Chief Accountant may or may not carry authority which largely depends upon the authority given to the Branch Manager or the Station Superintendent. Smaller airlines combine accounting work and

the purchasing under an auditor. Accounts have assumed special importance because airlines are closely controlled by the Government. Progressive airlines have now accepted cost accounting as an aid in controlling and improving the organisation and have made considerable progress in the application of costing technique.

The Chief Engineer

The size of the engineering establishment is determined by the character of the flight equipment, routes operated and the size of the business. Small and medium-sized airlines in India maintain inspection and maintenance sections, and an overhaul workshop for aircraft; engines and accessories being however left to an outside organisation like the Hindustan Aircraft. Large-sized companies, however, maintain an elaborate engineering organisation which further includes sections for aircraft overhaul, engine overhaul, and accessory overhaul. Where the engineering organisation is thus divided into number of sections, each section is managed by a Senior Engineer, who is assisted by Ground Engineers, foremen and mechanics. In addition, the Engineering Organisation also maintains 'Line Service Stations' to keep aircraft in airworthy condition en-route.

The Operational Manager

The operating success of an airline greatly depends upon the quality of the operational personnel including the Operational Manager.

The Operational Manager is responsible for the conduct of the flying operations, operational planning, planning of the schedules and control of ground communications. On the administrative side, he is concerned with the safety and efficiency of all flight and ground activities with the object of giving maximum service to the airline customers. One of the vital requirements for efficient operation of air transport service is careful planning of flight operations in relation to traffic and other requirements so as to achieve maximum utilisation of both equipment and flight personnel. The Operational Mana-

ger has, therefore, to endeavour to improve the scheduling of movement of individual aircraft and all flight crews so as to achieve the desired intensity of scheduled services with maximum of economy in aircraft and personnel. Besides supervising the work of the flying personnel, he also attends to the selection of crew and their training. His duties are thus both administrative and technical. He may be also required to maintain statistics for petrol consumption, aircraft hours, flying hours of pilots, etc. which are subsequently passed on to the statistical section of the General Administrative Department.

The Traffic Manager

A typical traffic department contains various sections like passenger traffic section, freight traffic section, advertising section and out-stations organisation. In general, the Traffic Manager has to supervise work connected with booking of passenger and freight traffic, reservation, solicitation and advertising. The Department issues tariff circulars, distributes time and fare tables and also arranges for internal and external charter operations.

The passenger traffic section is largely concerned with the sale to the general public of company's air transport services and performance of service functions in handling passengers and their luggage. Ticketings, reservations and bulletins are also looked after by this section. Small companies usually combine passenger and freight business together but larger companies maintain a seperate freight organisation which maintains close contacts with business houses and industry. The freight officer is assisted by several freight agents who solicit business and maintain contact with the potential customers. The freight section is thus responsible for operational handling, acceptance and disposal of the freight. The publicity section is responsible for drafting, producing and distributing printed literature to the prospective customers and is also in charge of newspaper publicity.

In addition, the traffic manager may be entrusted with the work of supervising the working of the several

outstation establishments each under either a Branch Manager or a Station Superintendent. A criterion of good station management is the ability of the Station Superintendent to promote business which makes the station operations profitable to the airline. Un-profitable station operations only suggest un-wise expansion into areas with very little traffic and inability of the management to control costs. Each station maintains a booking, freight and accounts section. In the booking office, the passenger reservations and ticketing are looked after. Cargo bookings are also done together with the weighing formalities and the compilation of the airway bills. At the airport office of each station, the staff attends to usual arrival and departure formalities. Besides the Branch Manager or the Station Superintendent, the station staff includes the clerks, peons, drivers, cleaners, loaders and the watchmen and local field mechanics for routine check up. The organisational set-up as outlined above is undergoing frequent adjustments on account of the rapid progress in the industry. Methods appropriate to the early years of civil aviation are fast becoming obsolete and the organisation of an airline must keep pace with the technical advance which is most rapid. The mortality of airline companies has not been small and the experience obtained from such companies should enable the remaining carriers to introduce more careful policies in the future.

(4) AIR TRANSPORT PERSONNEL

The air transport personnel consists of flying crew, ground staff, maintenance and servicing personnel and the administrative staff. The percentage of the skilled personnel is relatively much higher in air transport industry than in any other form of transportation, the earnings of skilled and unskilled workers showing sharp variations. Further, as compared with other transport industries, skilled workers in this class of business are also much better paid and the airline pilots are perhaps the highest paid class of employees. Air transport is highly an individualistic industry in which rapid techno-

logical porgress is continuously giving rise to higher skills and more intensive specialisation. A mechanic in the air transport industry has also a high degree of transferability as his skills are equally useful for other industries. The air transport personnel consisting of pilots, radio officers, flight engineers and ground engineers have periodically to take their licences and hence have to submit to a system of continuous training. For this reason, as well as due to the occupational risk, skilled workers in this class of business are much better paid. In addition, because of the very nature of business, airline personnel has also a higher percentage of young people as compared with other transportation industries.

The airline personnel before the last World War was very small and was not organised. The industry too was in the infant stage and the relations between the airlines and their employees were more or less on an individualistic basis. The growth of industry after 1945, and the post-war spiral of inflation which reduced the real earnings of the employees created a desire for the airline personnel of different categories to organise themselves. Employees attached to each airline have now unionised and the Air-India Employees' Union has been the largest of such unions. But the union policies in the airline business are not still developed and have been mainly confined to the wages and conditions of employment. Besides these unions, pilots and engineering personnel have also formed their associations. Indian Pilots' Guild, All-India Licensed Ground Engineers' Association, All-India Airline Radio Officers' Association and finally All-India Aero Employees' Federation have been the representative bodies, most of which have come into existence after 1945. During the last six years there have been a few strikes in the industry. They have been, however, scattered in nature and of local significance. The disputes in regard to wages, salaries and conditions of employment have arisen and have been settled by conciliation or by arbitration by the Industrial Tribunals. At present, there is no basic uniformity in wages, salaries and conditions of employment which

vary from company to company. As the airline personnel is now being organised on a broader basis, it is likely that some kind of standardisation of wages, salaries and conditions of employment may be achieved in the near future. By the end of 1950, about 7,500 employees were working with the different scheduled airlines which were paying a salary bill exceeding Rs. 16 lakhs per month.

Recruitment of the air transport personnel is not done in one uniform manner. One of the airlines viz. Air-India maintains an Employment Bureau in the Personnel Department for recruitment of staff of all categories. Airlines also provide training facilities for their employees. In the case of pilots, those who have

TABLE 25

Statistics of pilots holding commercial licences employed with different companies, Clubs and Other Institutions

(a) As on 30th June, 1950

FLYING CLUBS

Northern India Flying Club	..	..	3
Delhi Flying Club	..	..	2
C. P. and Berar Flying Club	..	..	2
Bombay Flying Club	..	..	3
Madras Flying Club	..	..	3
Government Flying Training School	..	..	3
Orissa Flying Club	..	..	2
Bengal Flying Club	..	..	2
Behar Flying Club	..	..	4
Hind Provincial Flying Club	..	..	8
Civil Aviation Training Centre	..	..	6
Hyderabad State Aero Club	..	..	2
			42

TABLE 25 (Contd.)

OTHER INSTITUTIONS	
Airlift Services	3
Segal Air Transport	1
Hindustan Times	1
Hindustan Aircraft, Ltd.	4
Gwalior State	1
Jodhpur	1
Indamer Flying School	1
Rajasthan	1
Faridkot	1
Jamnagar	1
Darbhanga	5
Kotah	1
Bihar Government	1
Bikaner	1
Tisco (Tata Iron and Steel Co.)	1
Madhya Pradesh	1
	28
GOVERNMENT OFFICERS	
Civil Aviation Department	8
Serving R.I.A.F.	6
	14
Airline Operating Companies	319
Employment particulars not known	40
Total	443

(b) Commercial Pilots Employed in India, April, 1952

	Indians	Foreigners	Total
(1) Airline operating companies	241	12	253
(2) Non-Scheduled operators	40	21	61
Grand Total	281	33	314

obtained "B" licence are taken on probation. Usually the pilot is required to give an undertaking that he would continue with the company for a certain period

and that in the event of his leaving the company, he would be called upon to re-imburse the employer with the cost of training. During the period of probation, the pilot is required to get the Dakota, Viking or other aircraft endorsement on his "B" licence. The airlines also provide conversion courses and refresher courses of training so essential for keeping up the efficiency of the pilots. The nature of training given by the airlines is now upto the standard adopted by the International Civil Aviation Organisation. Air-India was, till recently, maintaining a technical school for training of Ground Engineers. Indian National Airways and Airways (India) have been now providing technical Junior and Senior School training for mechanics and ground engineers. Similar facilities on a larger scale are also available with the Hindustan Aircraft, Ltd. In the air transport industry, a much higher and continuous training to employees of all categories is required as the industry is subject to rapid technical progress. Accordingly, the Indian airlines with their limited resources have been doing their best to train personnel which will keep the airline business functioning in a satisfactory manner. Many of the successful technicians working with different airlines in India have entered the industry through the company workshops and have succeeded in managing the technical units in the most practical manner.

(5) AIR TRANSPORT ASSOCIATION OF INDIA— (A.T.A.I.)

A Conference of the representatives of Companies operating scheduled services was held in December, 1948 under the Chairmanship of Sir Gurunath Bewoor of Air-India. As the result of the deliberations of this conference, an association known as "The Air Transport Association of India" was started with its head-quarters at New Delhi.

The objects of the Association are:—

(1) to promote transportation by air of persons, goods and mail within India and between any place in India and outside India,

(2) to advance the interest of its members by promoting co-operative efforts in all matters pertaining to their mutual interest,
(3) to improve the transportation service rendered by its members,
(4) to regulate tariff policies, to control uneconomic practices and to regulate conditions of employment including scales of salary and wages in the industry.

The Association has two classes of members. Any individual firm or company engaged in the business of transportation and holding a licence, temporary or provisional, under the Indian Aircraft Rules, is eligible for ordinary membership. Each ordinary member is required to pay an entrance fee of Rs. 3,000/- with the application of membership and an annual membership fee of Rs. 1,500/-. The associate membership is open to any firm, company, association or society engaged in the business or promotion in India of air transportation. An entrance fee of Rs. 1,500/- and an annual membership fee of Rs. 750/- is required to be paid for the associate membership.

The real work of the A.T.A.I. is done by the Committee to which each ordinary member is entitled to nominate a representative. The Committee have the powers to make bye-laws in respect of the following matters:—

(1) To regulate tariff policies,
(2) To promote the establishment and connecting schedules,
(3) To regulate and co-ordinate passenger and freight services including the provision for issue of through travel tickets on air service lines of different operators and
(4) to control uneconomic practices in the payment of salaries and wages of employees in air transport undertakings.

Another service that the Association renders is the provision of arbitration rules. Any member or any other

person may submit to this association for arbitration any dispute or difference in which the member or other person is interested. If any such dispute arises, it is referred to an Arbitration Committee, appointed by the President, consisting of three persons, one of whom works as an umpire. The decision of the Arbitration Committee is binding as agreed by the interested parties.

The objective of the Air Transport Association of India is thus to stimulate forces of central pool of experience, ideas and strength. The association is in a way, a co-ordinating agency, undertaking co-ordination in response to the needs of the airlines, travelling public and the shippers as also a clearing house of information. The association has done very valuable work since its inception by making representations to the Government of India and other authorities on the various problems connected with the air transport industry and by fostering a closer understanding among the airlines operating in the country.

CHAPTER VIII

AIRLINE REVENUES AND COSTS

AIRLINE REVENUES

Airline operators derive their revenues mainly from three sources viz. passengers, mail and freight. Some of the operators are able to supplement their earnings from other aviation activities like the charter operations. In the early days of air transportation, earnings from the mail traffic constituted the major portion of the income for the operators. As the passenger traffic was very small, the mail revenues subsidized the passenger traffic. If passengers were available, they were accommodated in the small open cockpit of the aircraft. By 1924, passenger and freight traffic began to supply with a steady source of income for the operators. Since then, there was a gradual shift from mail to passenger traffic in almost all the countries of the world. On the eve of World War II, passenger traffic had developed enough to overshadow the mail traffic but the revenues from mails still constituted an important source of income for the operators. But in India, passenger traffic on the internal services was very small on the eve of World War II and the revenues from the mail traffic constituted the major portion of the income for the operators. During the war-period, larger aircraft were introduced in India for the first time consisting of DC 2's and DC-3's. Though air services were run directly for the Government, a sizeable passenger traffic was also built during this period. At the end of the war, the air services had succeeded in creating a goodwill and developing a good passenger traffic. Since then, passenger revenues became for the first time a major source of income for the Indian airlines working under normal conditions. A detailed account of the revenues and expenses of the airlines is not available for study. Yet, there are reasonable grounds to believe that the domestic airlines in India

get about 80 per cent revenue from passenger traffic, about 10 per cent from freight and excess baggage and the rest from mail and other aviation activities.[1] The mail revenues of internal services show wide variations on account of difference in the mail generating capacities of the different routes. Before the introduction of night air-mail services in 1949, the mail revenue of an operator normally constituted about 3 to 15 per cent of the total revenue.[2] Even though passenger traffic has now attained some magnitude, operators all over the world still depend upon the mail revenues and mail subsidies which really give the air services the sinews of growth. Water-carriers fundamentally differ from airlines in this respect as revenue from passenger business form a minor part of their total earnings. The major part of their earnings comes from the freight. On the other hand freight is only a minor appendage in air transportation and the main business is the transportation of passengers and mail. As the public have now accepted air transportation as a normal method of transport, the air carriers can now look forward for increasing passenger revenues.

AIRLINE COSTS

In the airline business, the cost per mile of operating an aircraft varies very widely between services of different types. The chief factors affecting this variation are the frequency of the service, the size and type of the aircraft and the average length of stage on the service. The average cost per ton-mile of traffic carried is affected by the same considerations although not always to the same degree or in the same direction and is also affected to a substantial extent by load factors. In general, airline costs represent the average costs of a number of air

[1] The percentage of airline revenue from mail is normally higher on international routes. The main international airlines probably draw between 15 per cent to 20 per cent of their total revenue from the carriage of air-mail at the present time. (Air Mail Study, I.C.A.O. 1948, p. 32).

[2] Air Transport Inquiry Committee Report, 1950. pp. 114.

services and indicate chiefly the proportion between the number of high cost and the number of low cost services operated by each airline.

On account of the dynamic and youthful character of air transportation, costs have not been able to achieve healthy stability as in other agencies of transport like the railroads and the steamships. Because of the rapid technological progress in air transportation and the high rate of obsolescence, useful equipment has to be scrapped even before it has lost its usefulness. The airlines have again to be quick in taking advantage of the new improvements and the inventions in the interest of safety of the passengers. Thus, the coming of the turbo-jet and turbo-prop aircraft is bound to alter the cost concepts prevailing now in the industry.

In air transportation, certain costs are borne by the state, by providing airports, airways, ground organisation and meteorological facilities free of charge. The operator's expenditure is, therefore, confined to the purchase of the flying equipment and the provision of organisation incidental to the course of business. In absence of a large carrier investment, cost characteristics of aircraft performance hinge entirely around the aircraft itself.

The elements which go to make up the total operating expenses may be listed as follows:—

(1) Direct Operating Costs

These can be divided into—

(a) fixed direct operating costs which must be incurred irrespective of the amount of flying and
(b) variable direct operating costs which vary according to the amount of flying.

(a) The fixed direct operating costs include depreciation — aircraft, depreciation — spare engines and propellers, aircraft insurance and aircraft housing fees.
(b) The variable direct operating costs include fuel and oil, flight crew salaries (excluding hostesses), aircraft servicing, aircraft overhaul and landing fees.

(2) Indirect Operating Costs

These include operations on—costs (including flight crew insurance, travelling, accommodation expenses, uniforms and salaries for operations management and ground staff), training of flight crew, passenger services (including meals, hostesses' salaries, passenger insurance, surface transport, etc.), traffic, sales and agencies including salaries for traffic management, rent and agents' commission.

(3) General Costs

These include interest on working capital, administration, office rents and expenses, publicity, medical and welfare, accounts and audit and miscellaneous items.

An estimate of reasonable costs in rupees per hour for aircraft utilisation of 1000 hours per year for Dakota and Viking illustrates this break-down.[3]

TABLE 26

Estimates of reasonable costs in Rupees per hour. Aircraft utilisation 1,000 hours per year.

Item	*Dakota*	*Viking*
(i) and (ii) Depreciation - Airframe and Power-plants	40.0	98.6
(iii) Aircraft insurance	11.2	56.9
(iv) Aircraft housing fees	6.4	9.6
Fixed Direct Operating Costs sub-total.	57.6	165.1
(i) Fuel and Oil	211.3	259.1
(ii) Flight crew salaries	42.9	42.9
(iii) Aircraft servicing	59.2	90.0
(iv) (a) Airframe overhaul	49.2	98.0
(b) Engine overhaul	32.4	55.0
(v) Landing fees	14.0	13.8
Variable Direct Operating Costs sub-total.	409.1	558.8

[3] Report A.T.I.C. 1950, p. 88.

(i) Operations on costs	46.2	52.4
(ii) Passenger service	32.8	36.0
(iii) Traffic, sales and agency	44.8	47.0
(i) Interest on working capital	3.0	4.0
(ii) Publicity and Advertising	6.4	7.0
(iii) Medical and Welfare	4.0	4.0
(iv) Accounts and Audit	15.2	18.0
(v) Miscellaneous	5.0	5.0
Indirect and General sub-total	157.4	173.4
Grand Total	624.1	897.3

A few of the important items of costs outlined above have been discussed below:—

DEPRECIATION

Depreciation charges run very heavily into the operating costs on account of high initial value of the aircraft and a short period of useful life assigned to it. In the case of rail-roads, a locomotive is usually assigned a life exceeding twenty years and thus it has plenty of time to earn for its up-keep. Depreciation, in air transportation, has a special significance since it also includes an allowance for obsolescence which arises when an asset has to be discarded before the expiration of its normal life, usually because of its inability to compete with one of a modern and improved type. Depreciation causes gradual diminution in value while obsolescence causes a sudden diminution. In rapidly developing industries like civil aviation, the chief element entering into depreciation is obsolescence and its rate is largely governed by the technological progress. Depreciation in air transport is thus more functional than physical.

In the early years of air transport, aircraft were depreciated over a period of five years with a small salvage value. Experience has shown that the Dakota which was usually depreciated over a period of five years can now easily be assigned a life exceeding ten years. Recent practices about depreciation indicate that an average value for the obsolescence period for airframes,

power-plants and propellers can be chosen from 7 to 10 years according to the type of the aircraft. The annual sum to be provided for the depreciation and the obsolescence of an aircraft is usually arrived at by stretching equally over years of the aircraft's life (i.e. 7 to 10 years) the following costs:—

(i) The total first cost of aircraft with engines;
(ii) The total first cost of aircraft for spare engines (normally provision of spare engines is 50 per cent of the total number of engines installed in the aircraft);
(iii) The total first cost of aircraft for the estimated cost of spares which will be required throughout the life of the aircraft;
(iv) The cost of any modifications made to the aircraft after it has been purchased and before it goes into service.

When major modifications are made to an aircraft after it has gone into service, the cost is normally divided equally over the remaining years of the life of the aircraft and the resulting sum is added to the annual obsolescence charged for that aircraft.

It appears that no uniform practice has been followed by the Indian airlines in matters of depreciation and replacement provision. Besides the Dakotas, the Indian airlines operate a heterogeneous group of equipment and it is not surprising that there is little uniformity in calculating depreciation. Some of the new airlines have not provided any depreciation while in the case of older companies, the provision has been inadequate. With the majority of the airlines current costs have exceeded current revenues leaving nothing for the proper provision for depreciation and replacement of the aircraft. It, therefore, appears that the cost of replacement would invariably be very high for the Indian operators when the time comes for the purchase of the new aircraft fleet. At the same time, it cannot be overlooked that in most of the industries, it is not the practice to cover all the replacement cost by depreciation alone and especially when the cost of replacing the equipment

would be much more than the original cost of the equipment to be replaced. Any such replacement must be done out of fresh capital also.

Besides the aircraft, the operators have to provide depreciation for various other classes of assets. But, the rates of depreciation for the purpose of financial accounts are usually different from the rates allowed for income-tax purpose because in the financial accounts, it is necessary to take into account more particularly the probable length of life of each special type of asset. Following are the average rates of depreciation that are normally provided by the Indian airlines in their financial accounts.

1.	Motor cars	25 per cent.
2.	Motor coaches	25 per cent.
3.	Workshop equipment	10 per cent.
4.	Furniture and Fixtures	10 per cent.
5.	Electrical fittings and installations	10 per cent.
6.	Buildings	10 per cent.

The rates allowable under the Indian income-tax law are as follows:-

1.	Mechanical transport	20 per cent.
2.	Engineering fittings	7 per cent.
3.	Furniture & Fittings	6 to 20 per cent.
4.	Electrical machinery	10 per cent.
5.	Buildings	7½ per cent.
6.	Airframes	30 per cent.
7.	Aero-engines	40 per cent.

FUEL AND OIL

Since fuel costs in general account for more than 40 per cent of the direct operating costs for the Indian airlines, it is clear that these form a formidable obstacle to any reduction in the operating costs. So far oil is concerned, its cost in general amounts to about 5 per cent of the total fuel and oil bill. In India 100/130 Octane grade aviation fuel is universally used, which is slightly more expensive as compared with lower grade 91/98

Octane grade so largely used by airlines in U.S.A. and Australia. In view of the tropical conditions prevailing in India, it has been considered more desirable to use 100/130 Octane grade so as to take all possible precautions to reduce the tendency to increase in temperature and the resultant engine drainage. Further, with any use of lower-grade fuel the consumption per hour is also likely to increase and consequently no economy may be possible. An average Indian operator was paying about Rs. 2/10/- per gallon (including tax) at the cheapest point of supply in 1950 as compared with Rs. 1/9/7 paid by an Australian operator or Rs. 1/10/- per gallon by an operator in U.K. Thus an Indian operator had to pay about 62 per cent more than an Australian operator. The price that an Indian operator has to pay is still higher in places in the interior of the country. Thus at Mohanbari, the average price of aviation fuel in 1950 was about Rs. 4/6/- per gallon. At Agartala (Assam) where one of the Indian airlines has been operating scheduled services no fuel is available at all and the aircraft has to carry the fuel for the return journeys. The higher cost of fuel in India may also be attributed to the custom duty of annas fifteen per gallon levied by the Central Government. In addition in some of the States, provincial sales tax is collected. Though the Government of India have paid a rebate of nine annas per gallon to the airlines, the net price paid by the Indian operators at the cheapest point of supply in 1950 was still 32 per cent above the price paid in Australia. Unless further assistance in the form of a larger rebate is available from the Central Government, during the transitional period, Indian airlines may not be in a possible position to reduce the price for air travel in the country.

INSURANCE

Every operator has to provide insurance for the aircraft, the flying and ground personnel on company's duty and the property and equipment required in his business. There is, in addition, necessity to provide for

third party liability and passenger legal liability. If the operator carries air freight, protection must be sought by purchasing cargo liability insurance. Aviation insurance can therefore be described as an intermediate item because part of it can be included in the constant costs while items like passenger liability and third party insurance are really part of variable cost depending upon the amount of flying done. Indian insurance companies transacting aviation business lack experience to underwrite the aviation risk. The rates charged are, therefore, virtually dictated by foreign insurers and reinsurers whose rates are based on world experience. Though the policies in respect of aviation insurance are largely adapted to meet the requirements of each airline, certain well recognised factors are taken into consideration in charging the rates. The underwriter while charging the premium rates on the merit of each risk, takes into account the character and the age of the aircraft, reliability of the power-plant, accident rate and past history of the airline, maintenance standard, repair and overhaul facilities. Besides these factors, the technical experience and efficiency of the flying and ground staff, route organisation and navigational facilities on the routes to be operated are also taken into account. It has been a common experience that operators with largest amount of route-milage and complete repair and overhaul facilities are able to obtain more favourable terms from the underwriters. In aviation insurance, each risk is thus rated on its merits, taking into consideration the past claims and record of the operator and the indemnity required.

The aviation insurance in India is without a long history of acturial experience upon which the risk can be predicted. The market for insurance is also very restricted and the insurance rates are, therefore, relatively high. The risk involved in this class of business is very large compared to premiums available and one or two serious accidents may take the airline as well as the insurance company into troubles unless reinsurance has been assured. Though a few Indian companies have entered into aviation insurance, business transacted is largely in the nature of agency work for

non-Indian insurance market. The following Indian companies have been transacting insurance business.

1. New India Assurance Co. Ltd. 2. Sterling General Insurance Co. Ltd. 3. Ruby General Insurance Co. Ltd. 4. Bharat Fire & Genl. Insurance Co. Ltd. 5. Jupiter General Insurance Co. Ltd.	*Personal accident and aircraft:*

Besides these, there are eight other insurance companies which transact business only in personal accident.

As air transport industry is in infancy, the Indian insurance companies have been compelled to depend upon the London aviation insurance market for re-insurance. The net retention of Indian insurance is, therefore, very low. Even the underwriters in U.S.A. where air transport industry has reached a very high standard of technical development are largely dependent upon the London market for rating and reinsurance of their excess values. London, thus, transacts today between 60 to 90 per cent of the world's aviation insurance business. Aviation insurance in the London market has been built up in the marine insurance traditions and the rates are determined on a world experience. Thus, the rates charged by the Indian insurance companies to the operators are practically dictated by the underwriters and re-insurers in the London market.

Prior to 1945, only three air transport companies were operating and the market for aviation insurance was very small. Since then, there was an increase in the number of scheduled and non-scheduled operators. There has been also a steady growth in the passenger and freight traffic. These circumstances encouraged some of the Indian insurance companies to accept this class of insurance business. Between 1945-47, the aviation insurance rates were relatively low, but since then there has been a steady rise in the premium rates. This rise in rates has also been witnessed in other parts of the world and may be attributed to the past experience of

the London underwriters who had discovered that the premiums they had received were quite insufficient to cover the gigantic losses. Air transport industry all over the world is passing through a period of transition and when some kind of stability is established in the aircraft design and operational technique, rates may become more stable as in other forms of insurance business. Greater expansion of civil aviation in the world countries may also contribute to the gradual reduction in these rates.

The rates charged for different risks by insurance companies in India are as follows:—

(1) *Aircraft:*— Hull insurance is the coverage against direct damage to an aircraft and represents the largest insurance cost. Hull insurance rates vary from 6 to 7 per cent. Under the Hull Insurance, complete liability is not usually accepted by the insurance companies which generally underwrite the risk for a certain per centage of the loss. Normally, it is stipulated that damage upto the first Rs. 1000/- is to be suffered by the airline and the rest by the insurance company. Where the coverage is spread over large number of aircraft, the underwriters normally quote lower rates. Since the introduction of new models involving large investment, risk under this head has become greater.

(2) *Third Party Indemnity:*—Rates for this class of insurance depend upon the limit of indemnity and the type of aircraft in operation. For small aircraft, the indemnity limits are low along with the rates of premium. Third Party Cover is granted usually for Dakotas for about Rs. 3 lakhs for any one accident. For Rapides and other small aircraft, limits of indemnity vary from Rs. 50,000 to 2,00,000. The rates of premium vary from Rs. 300 per aircraft per annum to Rs. 150 for Rapides and Rs. 70 for smaller aircraft.

(3) *Passenger legal liability:*—The insurance cover carried by an operator does not cover the passenger unless it is proved that negligence on the part of the operator has caused the accident. The only way for the passenger to safeguard himself is to buy an insurance

policy for a particular trip. The cover for this class of insurance varies between Rs. 25,000/- to Rs. 50,000/- per cent. The current rates of premium for Dakota being near about Rs. 175/- per seat per annum if operated exclusively on internal flights. For flights on external or international routes, the rates vary from Rs. 250 to 450 per seat per annum.

The total premium for Hull, Third Party and Passenger Legal Liability varies between 8 per cent to 9 per cent for scheduled airlines and between 9 to 11 per cent for non-scheduled operators.

(4) *Flying Personnel:*— Pilots, Co-Pilots, Radio Officers and Air Hostesses are insured at a rate of between 2 per cent to 3 per cent per annum on the sum insured. For other airline personnel, the rate is about 2/3 per cent.

(5) *Passenger insurance:*—The passenger and his baggage are normally carried at the passenger's own risk and the airlines do not accept any liability of a common carrier. Passengers have, therefore, to insure themselves at their cost if they desire. Trip insurance can be purchased at the time of purchasing the ticket and the average rate in India is Re. 1 for every Rs. 10,000 for any particular journey by a recognised service. The world rate for this class of insurance is 1½ per cent to 1 per cent. Passenger insurance facilities are not, however, widely available in India as they are in other countries.

Under the Workmen's Compensation Act, the airlines have also to cover the risk for the ground and other staff while working within the scope of employment. Premiums under this class of insurance are based on the rates of pay for each class of employment. Airlines have also to insure air freight. The normal rate of premium being about 1 per cent on the gross earnings from freight during the policy year.

Though the total aviation insurance business transacted in India is very small, the underwriters transacting this class of business may be receiving about Rs. 50 lakhs per annum.

FLIGHT PERSONNEL SALARIES

The salaries of the flight personnel are spread over the operations of all the aircraft in the fleet. The emoluments of the flight personnel in air transport are much higher as compared with those prevailing in ground transport on account of high standard of technical skill, the occupational risk, higher cost of training and relatively a short duration of flying career. In India, the total average emoluments received by a Captain, a Co-pilot and a Radio Officer exceed Rs. 1,650, 1,000 and 570 respectively per month depending upon the length of the service. In U.K., a Captain and a Co-pilot get a maximum remuneration of about Rs. 1,800 and Rs. 1,100 respectively per month. In U.S.A. the salaries paid to Master pilot, Junior pilot and First officer are about Rs. 5,700, Rs. 4,000 and Rs. 3,000 respectively. In Australia, the Captain of a Dakota gets an equivalent of Rs. 750 per month and of a Constellation Rs. 1,000 per month. The flying crew working on international routes receive higher remuneration in view of the greater responsibility involved in these operations and the higher technical skill demanded from the crew. Besides the salaries and overtime allowance, pilots on the external services receive overseas and station allowance and a small allowance for uniform and medical expenses.

The emoluments received by the flying personnel in India include a flying allowance which depends upon the grade of the crew and is near about Rs. 10 per hour for a Captain, Rs. 7 for a Co-pilot, Rs. 7 for a Navigator, and Rs. 5 for a Radio Officer and about Rs. 4 for an Air Hostess. The flying allowance is paid for exceeding a specified period (usually 90 hours in any month) fixed by each airline. Though Air Hostesses can be included under flight personnel, their salaries are really a part of passenger service cost. On an average, an Air Hostess gets about Rs. 250 per month besides being entitled to a flying allowance, when her hours of work exceed a specified period.

The standard crew on the internal route in India usually consist of a Captain[4], a Co-pilot, a Radio Offier and an Air Hostess. On external routes operated by Skymasters and Constellations, the standard crew include in addition a Flight Engineer, Navigator[5] and an additional Air Hostess.

The emoluments paid to the flying crew and their duty hours have to be studied from two aspects viz. (1) mental and physical fitness of the crew throughout their flying career and (2) the safety of the aircraft. The Indian Aircraft Rules do not lay down any upper limit to the amount of flying within a specified period but in most of the countries advanced in civil aviation as in U.S.A., U.K. and Australia, the flying hours have been restricted to 1,000 hours per year or a mixiumum of 90 hours a month. Flying duties involve very great strain on the physique of the crew and at the same time, they have to maintain a certain standard of physical and mental fitness throughout the fiying career as it has a direct relation to the operating efficiency. Emoluments paid to the flying crew, conditions of service and stability of employment have a steadying effect on the mental outlook of the crew and are thus related to safety of flight. The pilots have now to qualify themselves under the I.C.A.O. standards which make more exacting demands on the efficiency of the crew. Few people can really qualify themselves as airline pilots with such a standard as a great many qualities have to be blended in them. Some of the qualities necessary are ability to interpret correctly the technical information passed on to them through a maze of instruments and the radio, the power to think coolly, clearly, and independently when mechanical aids fail and the powers to make decisions with confidence during black-outs, or in fog or blinding rain or storm.

[4] In India, licence endorsement for pilot-in-command (Captain) is given after a pilot has a minimum of 2500 hours flying experience including night flying.

[5] India had in 1950 only six first class Navigators with current licences and about 223 wireless operators.

LANDING AND HOUSING FEES

Aircraft housing and landing fees form a part of the direct operating costs. These are prescribed in section B of schedule V to the Indian Aircraft Rules. These fees are assessed according to the total weight of the aircraft or the class to which it belongs. The payment of landing fee entitles the aircraft to the use of the aerodrome for alighting and departure, the use of radio and night flying installations at the aerodromes, the supply of all available information as to weather conditions and the service of the aerodrome personnel. The fees charged for landing and housing are not any way higher compared to those charged in U.K. and U.S.A. In Australia, the airlines pay no landing charges, instead, they are required to pay route charges consisting of fees for landing and the use of navigational aids and meteorological services. Under the Indian system, when frequent landings have to be made for a stopping service, landing fees have a noticeable effect on the direct operating costs. On the other hand, a non-stop service pays much less. Under the system of route charges as prevailing in Australia, the burden of the landing fees can be spread over in a more equitable manner so that the over-all charges paid by a stopping service need not be greater. Landing and housing charges at the Government aerodromes in India are as follows:—

TABLE 27

Landing Fees

Type of Aircraft Class	Total weight	Landing charges for single landing	Housing charges excluding landing charges		
			Upto 24 hours	Monthly rate	Quarterly rate
A	Upto 2500 lbs.	1	2	40	80
B	2501- 7500 "	5	10	200	400
C	7501- 15000 "	10	25	500	1000
D	15001- 27000 "	25	40	800	1600
E	27001- 50000 "	50	60	1200	2400
F	50001-100000 "	150	100	2000	4000
G	100001-200000 "	300	200	4000	8000
H	Above-200000 "	750	300	6000	12000

MAINTENANCE

Day to day maintenance is known as servicing. The purpose of an aircraft's upkeep by which is meant its servicing, is to enable the aircraft to furnish the maximum output of flying work of required kind and intensity. For every aircraft, certain routine duties pertaining to its upkeep are inevitable and fixed. These duties consist of routine fuelling, oiling, etc. on the one hand and the statutory safety precautions on the other. The rest of the servicing consists of inspecton, including the examination of parts at pre-determined intervals and their repairs or replacement as deemed advisable. Time limits for these inspections vary with the type of the aircraft. There are a graduated series of daily, minor, intermediate and major inspections carried out by ground engineers. In addition, airlines provide facilities for servicing at the intermediate stations where qualified personnel and equipment are supplied to maintain aircraft and engines in air-worthy conditions *en-route*. Minor modifications are usually done at the time of servicing while more important modifications are done at the time of overhaul. The out-of-service period required for these inspections varies with the particular inspection and ranges from a few hours to several days for a major overhaul. The way in which the aircraft has been maintained is usually reflected in the extent of structural repairs carried on an aircraft during a major overhaul. Since maintenance lay-over periods reduce revenue-earning opportunities for the aircraft, maintenance planning is essential to reduce the time required for servicing to a minimum. Aircraft utilisation has also a direct bearing on the servicing cost. With increased amount of flying, the strength of supervisory staff need not be changed directly in proportion to the increased number of hours flown and the man-hours required for inspections can be spread over a greater number of flying hours upto a certain limit.

The aircraft maintenance personnel in India had to be trained by the airlines in the initial period of the industry. Practically all the employees in the airline busi-

ness belong to labour unions and in some cases these unions have obtained awards through the Industrial Courts covering their conditions of employment within their trade. A senior licensed ground engineer is paid on average a salary between Rs. 800 to Rs. 1200 per month, while a junior ground engineer receives between Rs. 500 to 700 per month. In addition, the ground engineers receive a special allowance or a licence allowance and a free insurance. There are many categories of employment with rates of remuneration below these scales down to the aircraft cleaner at about Rs. 80 per month. Supervisory personnel in the Aircraft Maintenance Department naturally receives somewhat higher remuneration than the physical hands. In general, strength of this category of staff bears a certain specific relation to that of the operating staff so as to make the entire organisation a balanced and economic unit.

AIRCRAFT OVERHAUL

In addition to the line inspections, every aircraft in India irrespective of the hours flown during the year has to undergo an annual inspection for the renewal of the certificate of airworthiness which is valid for one year only. In U.S.A. and Australia, the programme of aircraft overhaul is computed on the hours flown basis authorised by the appropriate state agency. Thus in the case of a Dakota, the permitted periods between overhauls vary between 7,000 to 10,000 flying hours This system known as "Progressive C of A" is being more and more adopted by several countries as it permits return of aircraft to the remunerative service in the shortest possible time. Under this system, continuous or running overhaul is done throughout the year. Every part of aircraft is assigned a life on the basis of hours flown and when a new part is substituted, overhaul is done. Under this plan, history cards for all the components of aircraft are also maintained. Progressive Certificate of Airworthiness has been already permitted in India in respect of Constellation and the Skymaster. As compared with this system, annual overhaul system

prevailing in India results in the aircraft being grounded for four to five weeks every year. As the aircraft is grounded for such a long period, high degree of utilisation cannot be achieved. Normally, a unit having a transportation of five million ton-miles may be regarded as sufficiently large for maintaining its own complete establishment. Most of the airlines in India have facilities for the overhaul of airframes. But overhaul facilities for engines are inadequate. The small size of most of the airline companies has prevented the establishment of fully equipped workshops, but Air-India and the Indian National Airways have maintained complete overhaul facilities both for airframes and engines. Rest of the scheduled airlines send their engines to the Hindustan Aircraft at Bangalore for overhaul. Workshops maintained by Air-India and the Indian National Airways consist of aircraft overhaul, engine overhaul, propeller overhaul, instrument overhaul and electrical overhaul departments. These shops have, in addition, subsidiary departments as machine shop, electrical plating shop, etc. The total airframe overhaul costs under the present basis of annual C of A overhaul is more than Rs. 49,000 for a Dakota and Rs. 98,000 for a Viking.

Besides the aircraft overhaul, the airlines have to carry out engine overhauls including overhaul of propellers and power-plant accessories. The average period of time lost for each engine overhaul is about three to four weeks. For a Certificate of Airworthiness overhaul per aircraft per year, engine overhaul life, generally assumed, is 700 hours, propeller overhaul life is 1500 hours and engine accessories are overhauled at engine changes. In U.K. and U.S.A., engines are overhauled every 1,000 hours of operation. For Skymasters, engine overhaul facilities are not available in India and the engines are sent to overseas countries for this purpose. The reasonable cost of an engine overhaul for a Dakota had been estimated by the Air Transport Inquiry Committee in 1950 was about Rs. 9,700 per power-plant and for a Viking at about 70 per cent over the engine overhaul cost for a Dakota. In India, the cost of maintenance and overhaul is relatively high on account of high prices which have to be

paid for spares which have to be stored up because of the uncertainty of getting them at the right time. The policy of calling in for annual C of A overhauls, instead of running overhauls and the low productivity of the labour have largely contributed to the excessive cost of maintenance and overhaul.[6]

MISCELLANEOUS ITEMS OF COST

(a) Expenses connected with training of the flight crew are substantial in the case of Indian airlines. Majority of the crew are trained only to minimum "B" licence standards on elementary trainers and a great deal of additional flying training is required for them. Training expenses include cost of fuel and oil, landing charges and remuneration for training instructors. Since there was no organisation in India which could train the pilots to the airline standards. provision for additional flying training and conversion training has to be made by the airlines themselves.

(b) Expenses connected with the passenger services include cost of operation of surface transport for passengers, meals and drinks for passengers, salaries and expenses of air hostesses and cost of cabin supplies. Majority of these charges vary with the number of passengers carried.

(c) Medical and welfare facilities mostly consist of free medical assistance provided to the staff at the headquarters as well as at out-stations, staff canteens where meals are available at rates below the actul cost and free transport for the staff to the airline headquarters.

(d) Airline publicity and advertising have not been well developed in India. Most of the airlines bring to the notice of the travelling public the relative advantages of their services by means of newspaper advertisements, magazine advertisements and posters. In addition, the traffic departments employ personnel to contact leading business houses and manufacturers. These contacts have been found useful in promoting freight

[6] Report A.T.I.C. pp. 82-83.

traffic and charter business. The amount allocated to publicity in the case of Indian airlines is usually less than 1 per cent of the revenue. Any increased expenditure on this item may result in an appreciable increase in the traffic. Besides the minimum practical costs, the operator is entitled to a reasonable rate of return on his investment. Air transport industry has been a business in which the investors have heavily lost and has, therefore, very little attraction for the equity capital. Manufacturing industries are on the other hand on different basis. Obsolescence and risk are of far greater importance in the air transport industry. State control is also more rigid. In view of the uncertain nature of business, relatively a higher return on the investment can be therefore justified. In U.S.A., the Civil Aeronautics Board have adopted the basis of 7 per cent return (after taxes) for the purpose of calculating the mail payments. The A.T.I. Committee in their recommendations had assumed a gross profit of 8 per cent on the capital investment in the industry as reasonable. This would provide for income tax amounting to about 3¼ per cent and reserve of 1¼ per cent leaving not more than 3½ per cent for distribution to the shareholders.

It would seem that, in summary, the direct operating costs which must be incurred irrespective of the amount of flying are largely determined by the characteristics of the aircraft. On the other hand, indirect operating costs and the general costs are under the control of the operator to a certain extent and are, therefore, influenced by the efficiency of management. Variations in the direct operating costs from company to company using the same equipment are not likely to be large but wide variations are possible in respect of those costs which are largely under the control of the operator. But even then, within certain range of flying, indirect costs do not show wide variations whereas the direct costs increase or decrease more or less pro-rata depending upon the number of flying hours. Longer flying hours with adequate load factor not only enable the airlines to earn revenue but also reduce more or less pro-rata the overhead expenditure. Volume of operation has, thus,

very close bearing on the spread and reduction of cost elements.

The proportion of direct to indirect costs in air transportation would vary with dfferent countries, and the individual carriers. In India, the direct costs vary from 60 to 70 per cent and this large proportion may be attributed to the high prices which the airlines have to pay for flight equipment, fuel and oil, insurance, spares and stores. On the other hand in U.S.A., the proportion of the direct costs for domestic operators has been below fifty per cent on account of a well-developed aircraft manufacturing industry, small cost of fuel and oil and the high level of efficiency attained by the airlines in that country. In the case of international operators, indirect costs vary from 50 to 60 per cent, largely due to the far flung organisation involving high personnel and maintenance costs. Conditions in the airline business invite comparison in this respect with the older forms of transport. Both in the case of rail-roads and steamships, large fixed investments are involved in the production of services. The standard of obsolescence is also quite different from that obtained in air transport. This explains why a much larger share of the total expenses of rail-road industry is in the nature of fixed expenses. In air transportation, fixed investment required to carry on business is small in relation to the operating revenues as airports and ground organisation are provided by the state. Though the overhead costs in air transportation are not so high as in rail-road industry, their incidence is high enough necessitating increased utilisation of the equipment and the personnel.

CHAPTER IX

AIR TRANSPORT PRICING

In the early days of the Indian air transport industry, air services were primarily operated to carry mails and the entire operating cost was borne by the postal services. Passengers and freight were occasionally carried and were expected only to pay the added costs and a little more. The passenger fares were, however, high and discouraged air traffic. As the airlines were entirely dependent upon the mail payments, much attention was not paid to the study of the costs of rendering various services. As passenger traffic developed between 1932-1939, air fares were fixed according to the circumstances and the policy of each scheduled operator. Rates were fixed in an arbitrary manner and were expected to attract business and to cover the operating costs. It is only with the growth of airline business during and after the World War II that attention was drawn to the need of a close study of the relationship between costs and pricing policy.

It is a basic principle in all modes of transport that the cost of operation must be covered by the revenue earned with a margin for reasonable return on the capital invested. Cost of service, therefore, forms the lowest limit below which traffic cannot be moved. The value which the users of services are willing to pay or can afford to pay is another consideration and forms the upper limit beyond which rates cannot be charged. In fixing the rates, the operator must also take into consideration competition from other air carriers and surface transport.

Air services normally carry passengers, mail and freight in a multipurpose venture involving joint cost situation. In the case of such services carrying composite traffic, fixation of rates for the different kinds of traffic offering must be based on what traffic can reasonably

bear. Passengers, mail and freight have varying degrees of urgency and make different demands for space. Freight has generally less urgency and is usually allocated residual capacity when passenger and mail loads fall short of capacity offered. Mail, on the other hand, is more regular and takes priority over freight. While in the case of railways, passenger traffic contributes relatively little to the overhead costs, in the airline business, the contribution of the passenger traffic is largest. There is no invariable principle upon which division of common costs can be made. It is a difficult and arbitrary process which has long been a headache to the rate making agencies. In the early stages of air transport, if conditions of demand do not permit passengers and freight to contribute pro-rata share of the common costs of providing the service, it has not been considered unreasonable to ask mail rates to contribute what is necessary to defray the rest of the costs. If mails are charged an excess of the allocated costs, it is only an indication that what traffic can bear is a consideration to be borne in mind in fixing the rates.

In the case of steamships and rail-roads, passenger revenues are relatively of less importance. By contrast, bus services and airlines are primarily passenger carriers and get bulk of their revenue from passenger fares. Where exclusive passenger or cargo services are operated, question of allocation of cost does not arise as a close estimate of costs to be incurred in the production of such services can be reasonably made.

Prevalence of decreasing cost conditions also have a bearing on the rate practices. This principle simply means that as output is increased, the cost per unit declines. With larger output of services, economies of large scale operations operate and these ensure more efficient use of flying and ground equipment and personal as those of administrative and technical organisation.

Every operator has to determine in advance the capacity ton-miles that he would be offering on each route and the probable load factor that he may be able

to get. On this basis, he has to calculate the reasonable costs for each route per year and the required revenue that he must obtain along with a desired margin of profit on his capital investment. This should enable him to calculate the equivalent passenger fare per mile or in the case of freight, the ton or pound rate per mile. If there is any appreciable drop in the load factor, it would necessitate a review of the fares to be charged. Since rate making is an art and involves the exercise of judgement, no absolute standards can be laid down.

AIRLINE MILAGE

In fixing the passenger fares or the freight or mail rates, the airlines usually adopt three types of milage. The most common method has been to calculate point to point milage or non-stop milage for the purpose. A pair of cities may be served by a direct service in addition to a stopping service. In the case of a stopping service, additional milage is involved on account of intermediate stops and yet the milage on which the fare may be based for the stopping service would be one determined by the direct service. The practices of scheduled operators are not, however, uniform in this respect and the total distance via the intermediate points are also used as the basis for calculating the basic fares. If the same city pair is served by more than one line, having unequal milage between the two points, it is the shortline operator that dictates the fare. To this fare the other airline must conform. Competitive milage thus determines competitive fares under certain situations.

Airlines in calculating the fares and rates either use equal milage rate principle or the variable base rate principle depending upon the circumstances. Under the former, airlines charge a certain basic per mile rate of fare. The mile-rate is then multiplied by the number of miles between two points for which a fare is to be established; the product of this multiplication, being usually rounded off to facilitate the memorisation of fares. Under the variable base rate principle, a larger latitude

is available to the operator. In actual practice, it is not possible to have a rigid rate prevailing on every route and a certain amount of flexibility in passenger and freight rates according to the availability of traffic is essential. Thus, it has been a general practice to permit the stopping service to charge a slightly lower rate for a through passenger in order to enable it to compete with a fast direct service. On the Bombay-Delhi route (708 miles) Air-India's fare in May 1950 was Rs. 155 for a stopping service and Rs. 175 rupees for a non-stop service. The first class rail-fare between the two cities was Rs. 107/12/- (861 rail milage).

Under competitive conditions, Air Services of India had also been charging Rs. 155 over the same route for their stopping service. On the night services operated over the same route by Air-India and Himalayan Aviation, the charges had been identical viz. Rs. 118/- each way.

Variations in the base rate may be adopted by an airline to support weaker routes. Thus lower rates may be charged by an airline on its weak and low density route which may be indirectly subsidized by higher rates charged on a remunerative and high density route. On short-haul routes as between Bombay and places in Saurashtra, full utilisation of aircraft and aircrew may not become possible. A stopping service over these short routes may involve additional costs. There is, therefore, every justification for charging higher fares on such unremunerative and short-haul routes. On such routes, higher basic fares enable the operator to cover the cost of booking passengers for short flights. Higher basic fares on short-haul routes thus protect the operator from an excessive amount of short distance travel. On journeys involving travel over more than one route operated by different airlines, a joint fare is charged. When issuing a ticket under the plan, the issuing airline acts only as an agent for another airline. When the routes under the joint fare are more circuitous in comparison with a direct and short service, the joint fare is usually identical with the fare charged by the short line. In U.S.A. and Europe, off-peak services known as

Coach Class services are operated with a fully depreciated aircraft between high density traffic points at an appreciably lower fare level than what applies to the normal standard services operating on the same route. On the other hand, premium fares may be charged when a new aircraft having operational superiority is introduced on the route. Thus, Air-India International charge an extra premium of Rs. 30/- on their Bombay-Calcutta route operated by the Constellation aircraft which is faster and more comfortable as compared with the Viking which is also operated on the same route.

Promotional rates have been introduced by most of the Indian airlines under which special discounts are given to tourists, vacation travellers, children and families during the off-peak season. Such concessions are an old rail-road tradition and are introduced only when there are good prospects that such concessions would move the traffic which would not move at the normal rates. Promotional fares usually result in increased utilisation of idle facilities and also provide an opportunity to the management to assess the potential traffic. The basic philosophy behind these promotional fares is that lower rates result in larger net revenues for the airlines. Since the promotional rates reduce fluctuations in traffic, airlines are also in a position to adjust their capacity to the changing traffic conditions.

On the international overseas routes, the cost of operating the services is higher than on the domestic routes. This explains relatively higher level of rates on these routes. Operators on these routes have also to face keen competition from other air carriers and steamships. Over such long-haul international routes, rates are based upon the tapering principle, that is, the rates increase with the distance but at a decreasing rate, thus resulting in lower fares per mile for the longer distances. Fares charged by Air-India International in August, 1950 on their Bombay-London route illustrate this tapering principle.

TABLE 28

Bombay - London Route.

Sector	Fares charged by Air India International Ltd. Sector fares	Sum of Sector fares	Through fare
Bombay - Basra	£ 54- 0-0	—	—
Basra - Cairo	£ 37- 0-0	—	—
Bombay - Cairo	—	£ 91- 0-0	£ 86- 0-0
Cairo - Geneva	£ 68- 0-0	—	—
Bombay - Geneva	—	£ 159- 0-0	£ 134- 0-0
Geneva - London	£ 19- 6-0	—	—
Bombay - London	—	£ 178- 0-0	£ 139- 0-0

It will be seen that the sum of the sector fares add up to considerably more than the through fare. The through fare is applicable even if passenger breaks journey en-route. The through fares are constructed on a tapering distance curve where the rate per mile is progressively reduced by a constant correction factor which in other words means that the rate per mile will be higher for short distances and cheaper for longer distances. The same principle is also applied to the construction of cargo rates. In the sphere of international air transport, the value of service as measured by 'what traffic will bear' has no doubt served as the maximum limit for constructing passenger fares. But the travelling public may not be in a position to bear rates as determined even by the minimum cost of operation. Public aid in some form may become essential under such circumstances in which case the state may have to subsidize the traveller. This has been particularly true when unremunerative routes have to be operated. In Europe, international routes to the neighbouring countries are very short and uneconomic for operation and passenger fares have been therefore relatively higher. European air services on these routes have also to face keep competition from surface transport. Before the World War II, inter-carrier pooling arrangements were quite common on the continent. Since the International Air Transport Association (I.A.T.A.) was created in April,

1945, all the international operators outside the Soviet orbit have now developed uniform passenger and freight rates. I.A.T.A. tariff is fixed on various considerations including distance, classification of routes, sector conditions and therefore varies from sector to sector. I.A.T.A. also now determines the commission to be paid to the agents. Traffic Conference of I.A.T.A. which meets twice a year reviews the problem connected with these rates. There are, at present, three traffic conference areas and the conference for each area takes its decision in the form of a resolution which when passed is subjected to the approval of the Government concerned. the Governments however retain the power to approve or disapprove these rates.

FIXATION OF FARES AND RATES IN INDIA

Prior to the establishment of Air Transport Licensing Board (A.T.L.B.) in October, 1946, the Director General of Civil Aviation in India used to grant licences to the scheduled operators and also fixed the maximum passenger fares. When A.T.L.B. was established, the work of fixing the fares and rates was entrusted to the new body. Under Part XIII of the Indian Aircraft Rules relating to the licensing of Air Transport Services (No. 14018), the Board is required to see that the passenger fares and the freight rates proposed including any concessional fares and rates, are reasonable in relation to the cost of service and the prevailing fares and rates on the other air and surface transport services. When the A.T.L.B. was established, the maximum fare was four annas per passenger-mile and the operators had to fix a fare below this limit subject to the sanction of D.G.C.A. For the first time in July, 1949, a minimum of 2½ annas per passenger-mile was introduced, the maximum being retained at four annas as before. The upper and the lower limits thus permitted an allowance for variable of load factor, route factor and other considerations. When the night air services were introduced in October, 1949, the passenger fares on these services were fixed at the first class railway fare by the

direct route plus 12½ per cent. The rates thus fixed in India are built on a straight milage basis with no taper in the rate per mile as distance increases.

During the inquiry by the Air Transport Inquiry Committee, the airlines had suggested fares ranging from 3 to 6 annas per mile, but at the same time, they all recognised that a fare in excess of four annas may prove to be deterrent. The committee discovered that on many of the routes, uneconomic fares were being charged by the airlines. The committee, therefore, suggested that for fixation of the rates, routes should be divided into three classes, firstly the inland trunk routes on which the reasonable fare many vary from 3¼ annas to 4 annas per mile, secondly routes on which fares may vary from 3½ to 4½ annas per mile and finally external routes to the neighbouring countries on which fares may vary from 4½ to 5½ annas per mile. The fares as recommended are linked up with a load factor that the committee had assumed as reasonable. The committee further observed that on the whole, as a general rule, the maximum fare on the internal routes should not be less than four annas a mile which includes a reasonable margin of profit on the capital investment.[1]

The present maximum level of passenger fares which works out at 4 annas per mile is quite reasonable. At the same time, this level of fares requires a high load factor to produce adequate revenues. In general, the fares on low density routes are higher in India than on those carrying a heavy volume of traffic. In some parts of the country, as in Assam, where fuel costs are appreciably higher than in the capital cities and where services are infrequent, the fares gradually rise from the maximum as these involve a higher proportion of standing charges. If the Indian airlines do not get any response in spite of the low fares, it only goes to prove that the traffic potential in the country is very low. That the passenger and freight rates in India are already low can be proved by comparison with fares and rates charged in 1950 in Europe and U.S.A. on services comparable. In Europe,

[1] A.T.I.C. Report, p. 128.

fares are fixed at about 7½d. or 6½ annas per mile while in U.S.A. the fares on comparable services are about 6 C or a little over than 4½ annas a mile. It cannot be overlooked that the Indian airlines are operating at a much greater distance from the source of fuel supply and are operating their aircraft at a low rate of utilisation which explain higher cost of operation in the country. Even the efficient airlines in U.S.A. have operated at losses for many years with much more efficient aircraft and only recently they have been able to break even. In Australia, many of the airlines have operated at rates near about 2.6 annas per mile on account of the fact that these airlines have been operating at a high rate of utilisation approaching 4000 hours per year.

The following table gives comparative rates in India and a select few foreign countries as prevailing in 1949.

TABLE 29

	Passenger fares. annas per mile.	Freight Rates annas per mile.
1. United States of America	4.6 to 5.1	17.0 to 58.1
2. United Kingdom	4.1 to 5.8	43.9 to 60.6
3. Australia	2.5 to 4.2	17.7 to 45.3

In European countries off-peak non-luxury services are run at night time and charge lower rates, the percentage reduction varying from 40 to 38 per cent over the normal fares. When night services were introduced in India in October, 1949, the passenger fares on these services were fixed at the first class railway fare by the direct route plus 12½ per cent but not lower than 2½ annas per passenger-mile by the direct air route. Normal British rates are about 5d. a mile with off-peak fares of about 3½d. to 4d. Continental fares are higher, normal rates being 7d. to 8d. per mile with off-peak fares of 5 to 5½d. In U.S.A. Coach class services operated on high density routes with a fully deprecated aircraft have been charging 3.6 annas per mile. Both in Europe and U.S.A., the effect of off-peak rates has been to render airlines

highly competitive with respect to surface transport. On the London-Paris route (219 miles) the normal return fare in 1950 was £14.8 while the off-peak return fare was about £10. The off-peak rate per mile works at about 5.2d. or 3.27 annas. Fares charged by the Indian airlines on their day services are already below comparable American fares while the Indian fares on night services with normal seating accommodation and comforts, are much below air-coach fares in America. It is thus clear that there is not much scope in India for introducing off-peak or dual fare system in view of the low density traffic offering and the higher cost of operation. Airlines in U.S.A. have been able to penetrate the rail market over above 500 miles haul. In India, first class air conditioned fares in 1950 were about 2 annas per mile while the second class fares were about one anna per mile. These are also much lower than those prevailing in most of the countries. The shift from rail to air has not been pronounced even on the long-haul routes. Most of the traffic carried by the scheduled operators has been created by the new mode of transport and with a level of fares between $2\frac{1}{2}$ to 4 annas per mile. There is therefore appreciably no chance in the near future of a shift of first class rail traffic to the airlines.

In the long run, air transportation will have to establish some relationship with the pocket of the general consumer in the country and it will have to be the objective of the airlines' pricing policy to draw to air travel the first and the second class passengers by the railways.

AIRMAIL AND AIRMAIL RATES

Airmail has made an important contribution to the development of commercial air transport all over the world. In its earliest phase, air transport was mainly operated in most of the countries mainly or exclusively as an airmail service by the postal administration or by military agencies. At first, airmail services were domestic in character. Gradually, these were extended

to external countries. In the early years of air transport, passenger traffic on these services was negligible as the air services were severely handicapped by the small capacity of the aircraft, the many hazards of flight and insufficient technical developments. The period from 1920 to 1927 was a period of incipient development and both the postal authorities and the airlines were still in the dark about the future possibilities for airmail. But by 1927, air transport had reached a stage when it showed signs of steady but slow progress. Substantial progress was made in the leading countries of the world in the carriage of domestic and inter-continental mail by 1939. When the Second World War started in the year, a set-back was given to the airmail traffic. By 1946, domestic and international air transport had emerged from the war difficulties and the airmail traffic once again entered a new period of rapid development. The enormous technical progress in air transport, the establishment of a world wide network of air routes marked the beginning of a new stage in the development of airmail traffic.

In the early years of air transport, entry into the business was largely regulated by the possibility of getting airmail revenues. Airmail payments were thus largely used for the promotion of the industry. Even to-day, mail payments have not been divorced from these promotional objectives even in countries like the U.S.A. where the air transport industry has reached a very high level of efficiency. In the United States, payment to the airlines for the carriage of mail is regulated under Sections 405 and 406 of Civil Aeronautics Act of 1938. In fixing the rate of mail payment, the Civil Aeronautics Board takes into consideration factors other than mail as specified in Section 406 (b) of the Act and payments are made to different carriers on different routes according to the "need" of each carrier. The responsibility of making up any deficiency in the revenues arising from unprofitable non-mail business is saddled upon the mail payments or the "need rates". On the other hand, where air services have attained self sufficiency, "service rates" are paid to the carriers for

the actual mail service rendered as measured by ton-miles of mail carried. It is generally considered that as in the case of "need rates", the "service rates" do not contain any element of subsidy. Mail-payment practices in other countries widely differ. In the U.K., the payment made to the carriers for the carriage of mails is based upon operator's published charges for the carriage of ordinary air freight and is at a rate per pound of mail conveyed. In Canada, rates for the carriage of mails are negotiated directly by the Post Office with licensed air transport operators and only such services are utilised as offer a substantially attractive enough carriage rate.

Traditionally, airlines have pleaded that when a composite traffic is carried on the air services, mail can bear a much higher rate than the freight rate. Mails get priority in transmission and weight for weight, they occupy more space than luggage. On the other hand, the postal authorities have usually pleaded that the mail rate should not contain any preferential element in the nature of a subsidy. Mail, as compared with freight, has certain advantages for the airlines. Thus, as assured load is offered every day; airlines do not have to provide surface transport to and from airports, catering and service charges do not have to be incurred and no advertising and publishing expenses are entailed. On these grounds, the postal authorities have generally pleaded that the mail rate should be directly related to the value of service rendered and considerations like the ability of this class of traffic to bear a higher traffic rate should not come in.

First class mail, therefore, should not have to pay a higher charge than the freight rate. Second class mail (like newspapers, printed papers, books and sample packets) is also of educational value and as such is charged at a lower rate when carried by the surface transport. The rate for the second class mail for carriage by air should be below the first class mail and should be low enough to attract such traffic to travel by air. Once the rates for first class and second class mail are determined, they should be fixed on a stable ton-

mile basis and should not fluctuate with variations in the situation of supply of demand.

The view points advanced by the airlines and the postal authorities widely differ but it appears that under the existing circumstances, it is necessary to take into consideration the average operating cost of the airline on the route concerned, the space needed to carry the mails, direct and indirect expenses incidental to the carriage of mail and a reasonable profit. As majority of the air services throughout the world carry both the passengers and mail in a combination plane, the question of the allocation of common costs naturally arises. The question, however, is a highly controversial issue on which widely different views are held. The basis chosen for such an allocation is decided to a certain extent by personal opinion. But, the most common method used to allocate common costs to each type of traffic in a combined transportation of mail, passengers and freight is based on the "ton-miles" performed.

AIRMAIL DEVELOPMENT IN INDIA

In 1931-32, when the Imperial Airways and other foreign services began to operate across the Trans-India route, the Government of India made provisional arrangements with the Imperial Airways and subsequently with the Delhi Flying Club to carry mails from Karachi to Delhi. Extention of the Empire Services thus led to the development of the internal routes by the Tata Airlines and the Indian National Airways which were established in 1932-33. Before the Second World War, these airlines were entrusted with the work of carrying the airmail on the designated routes. These services carried the surcharged mail over certain routes and did not receive any subsidy from the Government. The operators were, therefore, compelled to carry the risk of inadequate loads. Surcharged mail thus became the only traffic foundation for the domestic services in India. But the mail was not quite insubstantial as it included a good quantity of over-seas mail to destinations in India

brought by the Imperial Airways and the other foreign international operators. The entire operating cost of these services was therefore borne by the Indian postal authorities. Passengers and freight were carried to some extent and were expected only to pay the added cost and a little more. This was exactly the reverse of the European experience where the passenger business was then growing rapidly and the mail traffic was negligible. It must be, however, admitted that the passenger and freight rates charged by the Indian airlines were relatively high and discouraged traffic. The mail payments to the Indian airlines were restricted to the necessary minimum to produce airmail services and in a sense the Government of India chartered the Indian air services for the carriage of mails. The payments to the Indian airlines therefore constituted purely a postal payment rather than an airmail subsidy. This is illustrated by the undertaking which the Government of India gave to the Indian National Airways started in May, 1933 to the effect that no other company would be given any mail contract for the operation of services in the North and East of the main Empire route in India. It, therefore, appears that the original intention of the Government of India was to promote air services through mail payments which provided a regular and assured income to the two airlines which could earn more by carrying non-mail traffic. In 1938, Empire Air Mail Scheme was introduced which necessitated the provision of facilities for the distribution of mails within India by air, brought by Empire Services and for collection of mails destined for Empire countries.[2] In 1938, the Government of India accordingly entered into 15-years countracts with these companies for the carriage of mails on their routes. In the case of Tata Airlines, a guaranteed payment by

[2] Similar schemes had been put into effect or were contemplated in the leading countries of the world. In June, 1937, the Netherlands Government inaugurated the carriage of non-surcharged airmail on the route to the Netherland Indies. In France, plans were also under discussion for the carriage of non-surcharged mail by air on all French Imperial routes.

the Government of India of Rs. 15 lakhs a year for carriage of mails on the Karachi - Colombo route upto 500,000 lbs. plus Re. 1/- for each lb. of mail extra and in the case of the Indian National Airways, a guaranteed payment of Rs. 325 lakhs a year for the carriage of mails on the Karachi - Lahore route upto 130,000 lbs. plus Re. 1/- for each lb. of mail extra was agreed upon between the Government and the two airlines. As the result of these contracts and the growing passenger traffic, the airlines were about to buy larger aircraft when the war intervened.

With the declaration of World War II in 1939, the Empire Air Mail Scheme was suspended and the scheduled services came to be operated entirely under the control of the Government of India. During the war period, payments to the Air-India came to be continued on the basis of agreement made in 1938. In respect of the Indian National Airways, an *ad hoc* arrangement was made for the actual services operated. In October, 1946, so far airmail was concerned, the position was restored to that under the 1938 agreement. With the partition of India in August 1947, the position was again altered as the Air-India and the Indian National Airways lost their mail routes to Pakistan. It, therefore, became necessary to revise the 1938 agreement. After some negotiations, it was agreed upon that the payment of Rs. 15/- lakhs a year to the Air-India (successors to Tata Airlines) should be reduced to Rs. 10 lakhs per year and that Rs. 3.25 lakhs a year guaranteed to the Indian National Airways be reduced to Rs. 1 lakh per year. The mail rate for all internal services except for the old contract routes was fixed by the Government in 1946 at Rs. 1-8-0 per pound. This rate was continued upto 31st March, 1949 when the All-up Airmail Scheme was about to be introduced.

NIGHT AIRMAIL

During the latter part of 1948, the Government of India decided to start a night airmail scheme connecting

Delhi, Madras, Bombay and Calcutta with an exchange of mail at Nagpur. The scheme was submitted by the Ministry of Communications to the Licensing Board on 24th January, 1949. A copy of the scheme was sent by the Board to the operators who were invited to attend the meeting of the Board on 29th January, 1949 when the Board would select the operator. As none of the operators were ready to accept the contract without any guarantee of minimum payment, it was granted to the Indian Overseas Airlines who accepted the terms of the Government. The licence to operate the night air mail scheme was granted by the Board with effect from 31st January, 1949. These services, however, carried the surcharged mail. In the meanwhile, the Government decided to start the All-up Mail Scheme with effect from 1st April, 1949 in order to speed up the carriage of mails on routes where air transport was available and to help the airlines to secure more revenue load. The night air mail scheme now became a part of the all-up mail scheme. These services had, however, to be suspended about the middle of June, 1949, as it was considered that the organisation of the air routes concerned had not been brought up to the requisite safety level for flights in monsoon conditions. The night services were resumed after the monsoon, from the 15th October, 1949. The Himalayan Aviation Ltd., was licensed for this purpose. As the organisation on the routes had, by this time, been strengthened by adequate navigational aids, the Company was allowed to carry passengers on night services. In addition, a direct night service between Delhi and Bombay was introduced by Air-India from 1st March, 1950. The Himalayan Aviation Ltd. continued to carry night mail services till 1st June, 1950, when the work was transferred to the nationalised Deccan Airways, Ltd. The all-up scheme introduced since 1st April, 1949 has proved to be an unqualified success and the great acceleration in the transmission of inland mails has met with general public approval. The night airmail scheme which constitutes the most important agency for the conveyance of mails under the all-up scheme now operates uninterruptedly throughout the mansoon period. Efforts are also

being made to extend the system of giving airlift to all letters and post-cards within India to as many regions in the country as practicable. The services of even non-scheduled air services are being now utilised for the carriage of mails on routes where no scheduled air services are available.

The one significant effect of the introduction of all-up scheme was the change in the rates for the mails. The mail-rates were now linked to freight rates. For First Class Mail, the rate of remuneration on internal services was fixed at freight rate plus 25 p.c. and for air parcel at freight rate minus 25 p.c. The rate on the external routes like Air-India's Indo-Ceylon, Indo-Pakistan and Ceylon-Pakistan sections was fixed at 8 annas per lb. over the corresponding internal rate subject to a guaranteed minimum annual payment of Rs. 10 lakhs and on other Indo-Pakistan and Indo-Burma routes at Rs. 6-1-1 per ton-mile corresponding to the rate paid to B.O.A.C. and other Indian external services. For second class mails, a rate of Rs. 3-0-6 per ton-mile had been accepted by Air-India International and B.O.A.C. The rates for the carriage of mails on the external services are now determined on the basis of rates fixed by the Universal Postal Union of which India is a member. Thereafter, the postal authorities fix the rates with the airlines concerned. So far rates for mail on internal services were concerned, they were fixed by the Licensing Board under Rule 153 of the Indian Aircraft Rules. This practice has been now altered and the mail rates are now fixed by negotiations between the licence holder and the Director General of Posts and Telegraphs Department. In the event of disagreement between them, the rates are determined by the Board upon a reference made to it by either of them.

The problem of airmail rates was considered by the Air Transport Inquiry Committee. It was recommended by the Committee that the mail rates should be freight rates plus 12½ p.c. on which basis the mail rate works out to Rs. 3-1-0 per ton-mile. A rate slightly above the freight rate was recommended for the reason that mails have to be given priority of transmission irrespective of any variations in the volume of mail. For the Second

Class of Mail, the rate suggested was freight rate less 25 p.c. which works out at Rs. 2/- per ton-mile. In respect of external services to the neighbouring countries, a rate 50 p.c. above the internal rate viz. Rs. 4-9-6 per ton-mile for the first class mail and Rs. 2-8-0 per ton-mile for the second class mail was recommended. Remuneration for the carriage of the first class and the second class mails and the air parcels in respect of other Indian external services was to be the same as then was paid to B.O.A.C.

Airmail is bound to play an important role in the future development of air transport in India. There has been an average increase of 5 to 6 p.c. per year in the postal traffic. This, by itself, should provide for an increase of 30 p.c. in mail loads in the next quinquennium. With the opening up of the country by the extention of the present air network, there is bound to be a greater diversion of mails from surface routes to air. It will not, however, be a practical proposition to introduce special air services for the carriage of mail as mail by itself cannot support such exclusive services.

CHAPTER X

AIR-FREIGHT SERVICE

In the early years of air transport industry in India, freight traffic was partially neglected because the airlines were primarily operated for carrying mails. Even before the World War II, freight was showing signs of gradual expansion on the internal and external routes. The war events, however, demonstrated for the first time the large potentialities of air commerce. During the war period, Indian airlines carried a very large amount of cargo to the different theatres of war on government account. Since then, there has been a steady development of air freight over the different routes operated by the Indian airlines. The rise of a new class of freight carriers was also witnessed in India during the immediate post-war period. To a certain extent surplus aircraft, obtained from the Disposals after the war, also stimulated the development of freight traffic by scheduled and non-scheduled operators. Air freight is, thus, essentially a by-product of the developments in air transport.

Air freight may be described as goods of air commerce other than passengers and mail. Sometimes a distinction is made between air express and air freight. The type of goods shipped by air express are usually emergency shipments and are carried on the next flight to the intended destination. Air express is generally carried at rates, which are close to passenger rates, which also include charges for special handling and expedite delivery. Air express is thus a demand service and has a precedence position.

Air freight on the other hand may be carried in a combination plane or in a all-cargo aircraft. If it is carried in a combination plane, it moves slowly when space is available. The deliveries are usually timed and

not so prompt as in the case of air express. Air freight rates which are relatively lower as compared with express rates also make an allowance for volume of movement. Air express charges, however, offer no such concessions. Indian airlines make no such distinction between air express and air freight and all the goods offered are normally carried as air freight.

On account of the high transportation charges, goods entering air commerce, have special characteristics. The goods usually have either a high emergency value or a high intrinsic value and are usually limited by size and weight. But in the case of exclusive freight services, the size of the shipment may be larger and even goods of high weight and density may be accepted for transport. Since goods carried as air freight have a varying degree of urgency and have varying space demands, the operators can introduce an element of discrimination in the structure of the rates. It is also on this basis, that the operator can make a distinction between expedited vs. deferred service.

The goods have another characteristic even when no emergency is involved. In their case, the spread of the price between the place of departure and the place of destination is so wide that the goods can bear the high transport charges. The difference in the market values thus determines 'what traffic can bear'. Even in the case of low priced goods, speed is valued if a new market can be created. Thus in the case of newspapers, which have now widely taken to air in India, a new trade territory has been created. The new demand created in this manner has given many Indian newspapers an increased circulation. In the case of some goods like newspapers and weeklies, an increase of value would, therefore, depend upon the time factor. This effect of speed is particularly noticeable, where goods are transported over long distances. But on short-haul routes under 300 miles, it is not so advantageous to carry goods by air as rail and bus transport can be profitably used. But such a limitation may not apply in regions like Assam where adequate surface transport facilities are not still available.

The shippers of air freight gain certain advantages from air services. Besides speedy delivery, there is less spoilage and less time-deterioration as in the case of perishable articles travelling over long distances. A larger trading territory and an extended selling season is available to the goods of the shipper who consequently is saved from the losses arising out of cancellation of orders. The demands of world wide markets can be satisfied instantly if goods are sent by air. Shippers are thus able to release their capital far more quickly by speedy delivery of goods to their destination.

FIXATION OF FREIGHT RATES

Where freight is carried in exclusive cargo planes, all the costs can be spread over the different commodities carried as cargo, making suitable allowance for the varying weight, density and 'what the traffic will bear' considerations. But when freight is carried in a combination plane, the problem of cost allocation arises.[1] In a combination plane, the cost of carrying freight does not differ much from the cost of carrying passengers so far direct and indirect flying expenses are concerned and this cost can be allocated over passengers, mail and freight per ton of payload carried, whether it is a ton

[1] In any aircraft carrying the composite traffic, un-used capacity can be flown with no appreciable increase in direct flying costs. The unused capacity varies with the size of the aircraft and with the frequency of schedules operated. The operator would, therefore, welcome any freight that would fill in un-used capacity so that it may make a contribution to the overhead charges. Freight, therefore, assists the operator in meeting the cost of passenger service operating below economic capacity. Some carriers believe that the freight rates should therefore include only those costs which would not have been incurred had such traffic not been carried. Small airlines on the other hand believe that where smaller load factors are available no extra cost is incurred in hauling freight since considerable un-used capacity exists on many flights.

of passenger or a ton of freight. Though traffic and advertising charges are usually greater for passenger traffic and ground handling charges in case of freight, the rest of the the charges excluding direct and indirect flying expenses can be equitably distributed so that passengers, mail and freight bear their full share of allocated costs. As passengers, mail and freight are carried under a joint cost situation, precise allocation of costs as between the three presents many difficulties. Any allocation, under the circumstances, would be arbitrary, though it does not mean that it would be unreasonable.

Air freight rating is still in an experimental stage on account of the changing character of the industry and it may take some time before the freight rates become stabilised. In determining the rates, every operator takes into consideration the rates charged by competing surface transport which has the greatest advantage in this particular field.

In view of the fact that every aircraft has to operate with a weight limited payload appropriate to a given stage, weight, density and capacity for compactness are a vital consideration. Density or pounds per cubic foot is, therefore, one of the governing factors. But space consideration is also increasing in importance. Usually 400 cubic inches have been considered as equivalent to 1 lb. on the domestic routes and 200 cub. in. as equivalent to 1 lb. on the external routes when volume charges are levied. On Air-India's services, parcels, packages, etc. having dimensions exceeding 440 cubic inches per kilo are charged on the volume basis, each excess of 440 cubic inches or fraction thereof per kilo being considered equivalent to one kilo. On external services, a minimum charge of one kilo is assessed by Air-India International and a fraction of kilo is charged to the next highest half kilo. A shipment weighing less than one kilo for each 440 cubic inches is assumed to weigh one kilo for each 440 cubic inches or fraction thereof for the determination of weight charges to be assessed. Volume shipments are not a paying traffic and the airlines are able to earn more revenue when density of shipments equals loading density. Light shipments occupying considerable

volume have been, no doubt, accepted and assessed on a volume charge, but frequently the charges may contain a penalty to compensate the operator. But the penalty associated with low density shipments will not necessarily be equal to the loss resulting from the inability of the operator to accept higher density freight. Some companies, however, accept light bulky parcels at cubic rates when the charge on this basis is greater than at weight rates.

Besides weight, density and volume, the operator has also to consider 'what the traffic will bear'. Difference in the volume of the goods between the points of origin and destination enables the operator to know 'what traffic will bear'. Consequently high priced articles with considerable intrinsic value have a greater capacity to bear relatively higher charges. This principle, therefore, becomes a basis for classification of goods for different charges. Since the airlines incur a greater risk in the carriage of such goods, cost of insurance, against loss or damage, would be reflected in the rates. In the case of valuable cargo, all shipments have to be declared for carriage in consignment notes at the actual value of the cargo and in any case such value for carriage must not be less than the value declared for customs as entered in consignment note. The rate for consignment of gold bullion is 150 per cent of the basic cargo rate charged on Air-India International's external service. On internal routes, Air-India's charges for gold are four times their ordinary freight rates per kilo on weight basis. In the case of perishable goods, the risk increases with the perishability and the risk and the added cost of special handling are reflected in the rates charged for these articles.

In actual practice, freight rates show considerable variations according to the nature of service on which they are charged. The basic rate is the maximum which may be charged on any consignment, but the needs of business may dictate various concessions to the shippers. These concessions may consist of special reduced rates for

various commodities, reduced rates for newspapers,[2] and containers returned empty, and special low back-loading rates on certain routes to improve the directional balance of traffic. Airways (India) operating exclusive freight services on the Calcutta-Bagdogra route have been offering low back-loading rates to the shippers as adequate return-loads are not available on the routes. Besides the concessions listed above, rebates to consignors whose freight account reaches a certain specified total figure per month have been normally given. The net result of these concessions is that they tend to reduce the average yield on the freight carried.

Besides freight, the airlines carry extra baggage. Indian scheduled operators normally permit 44 lbs. for a free baggage allowance. Baggage in excess of 44 lbs. is chargeable at the scheduled excess baggage rates. On the external routes, Air-India International permits 66 lbs. as free baggage per adult passenger. The charge for baggage over the free allowance is 1 per cent of the adult one way fare per kilo (2.2 lbs.) for the first 10 kilos (22 lbs.) of excess weight. For all weight over 10 kilos, the charge is one half of this amount. The revenues from the carriage of extra baggage are usually bracketed with the freight revenues, but in some cases baggage charges are directly related to the passenger fares.

Some of the airlines have adopted the policy of charging a uniform rate under a single classification irrespective of the distance that the freight travels. Others have adopted the system of charging commodity-wise or according to the class to which the commodity belongs. Where specific commodity rates have been provided, these rates take precedence over the airline's

[2] On external services of Air-India International newspapers are carried at fifty per cent of the basic cargo rate subject to each consignment weighing 5 kilo or more. On the internal routes, Indian airlines give a discount of not more than 25 p.c. of the normal cargo rate on a consignment of 5 lbs. or more of newspapers and periodicals published at least once a month. Credit facilities are also allowed to newspaper consignors on obtaining a Banker's guarantee.

proportionate rates between points of origin and destination. On the international routes, the whole basis of calculating freight rates is now standardised by I.A.T.A. to which nearly all the airlines belong. The principle of tapering rates has been also adopted by I.A.T.A. for freight moving on the international routes.

FREIGHT RATES IN INDIA

Prior to October, 1946 when A.T.L.B. was established the freight rate was related to the passenger fare, the weight of a passenger together with the baggage allowance of 44 pounds being taken as 200 pounds and the freight rate was fixed at 1/2 per cent of the passenger fare per pound of freight with exceptions in certain cases. These rates were approved by A.T.L.B. and were continued upto the end of June, 1949. After 1st July, 1949 minimum and maximum limits were prescribed for freight rates which were allowed to vary between ¼ per cent and ½ per cent of the passenger fare for each pound of freight. The actual freight rates were, however, subject to the prior approval of the A.T.L.B. When the night air services were introduced on 15th October, 1949, the freight rates on these services were to be the same as those for the day services on the same routes. With effect from 3rd December, 1949, the freight rates were delinked from passenger fares and discretion was given to the operating companies to introduce any freight rate between 14 annas per ton-mile and Rs. 2/12/- per ton-mile subject to subsequent approval by the Board. The whole question of freight rates was reviewed by the A.T.I. Committee which recommended that the freight rates should be once again related to the passenger fares for each route subject to maximum of ½ per cent of the passenger fare per pound of freight. The committee, however, felt no necessity of fixing a minimum rate.

The freight rates are charges for transportation of goods from airport of departure to airport of destination and do not include pick-up and delivery charges which are published separately. If an airline undertakes this work, the charges are usually on cost basis only. The

cartage rates differ from place to place and depend upon the distance. In case of custom clearance, a clearance charge equal to the cartage charge is payable for clearance of goods through customs when necessary. In the case of air express, the rates include charges for collection and delivery. Most of the airlines have now introduced cash on delivery system (C.O.D.)) for goods sent by air. Under C.O.D. service, the cost of the goods as well as the freight charges are collected from the consignee on behalf of the consignor. The amount of the C.O.D. thus collected is then remitted to the consignor for which a small service charge is made. The charge usually depends upon the amount collected. On external services from India, a valuation charge as laid down by I.A.T.A. is payable on the shipper's declared value for carriage in respect of goods having a declared value of Rs. 78/- or more, but less than Rs. 933/- per kilogram. For goods having a declared value of Rs. 933/- or more per kilogram, in addition to the charge on weight or volume basis, a value surcharge is payable by the shipper as laid down by I.A.T.A. on value declared for customs.

Most of the Indian Companies accept consignments for dispatch over their own and connecting air routes. The receiving depots for freight are the offices of airlines and their general agents in town en-route. The nature of the contents of the consignment must be declared and usually airlines reserve the right to open and examine any parcel. All goods not of dangerous and objectionable nature may be forwarded.[3] Freight for dispatch on internal Indian airlines may be lodged at most airports 30 to 40 minutes before the departure of the aircraft, but if the consignments are of considerable size, weight or volume, prior arrangements have to be made. When freight arrives at its destination, the addressee is immediately advised, if possible, by telephone, and failing that, by first mail. In some cases, companies deliver goods free of charge within immediate

[3] Goods of objectionable nature include explosives, inflammable liquids and solids, arms and ammunition.

city areas. General insurance may also be effected with the airlines when despatching freight. When an appropriate premium is paid, the goods are insured on behalf of the shipper under an open policy which assures compensation to the extent of actual loss or damage. The insurance is based on declared value for carriage as inserted on the airway bill by the shipper. In the case of precious freight, airlines do not accept the consignment unless the consignor has insured the parcel at his own cost.

So far fragile goods are concerned, premiums are quite low in view of their short life.

The Indian airlines are still experimenting with rates for bulk carriage of freight and with the system of giving rebates and charging commodity rates at a specially reduced level. In spite of very attractive terms offered to the consignees, the present day-services are flying underload on account of the rigid habits of the Indian businessmen. Some of the Trade Associations have been appreciating the services rendered by the airlines in the carriage of freight. It is understood that the Silk Merchants' Association, Bombay, had a bulk cargo agreement with Air-India. The cargo, which was subject to a sliding scale of rebate, was collected by the Association. Such association-agreements are beneficial particularly to the small businessmen whose turnover is small. Cargo representatives of the Indian airlines contact business houses and in a few cases conference method has also been used to convince the businessmen of the value of sending goods by air. Under the guidance of Air Transport Association of India, some kind of standardisation has also been introduced in the rebate system particularly on competitive routes. For small merchants who cannot benefit under the rebate system and whose turnover of business is small, commodity rates have been particularly helpful.

PASSENGER AND FREIGHT AGENTS

A new class of passenger and cargo agents has come into existence since 1946. The agents also work as freight forwarders and custom brokers. Some of the non-sche-

duled operators have been also utilising the services of these agents. The usual method has been to hire out the aircraft to brokers for freight. The brokers then fix the rates to be charged to the shippers. The rate is a compromise of what the owner of the aircraft wants and what the freight or the passengers can afford to pay. Fluctuations in rates are governed by the supply of aircraft, space available and the number of owners competing for the traffic. There are about 16 such firms working in different parts of India including Air Freight, Ltd., Mercury Travels and Messrs L Passo. These agents work as general, sales or chief agents for one or more airlines. All the agents are now on the approved list of the Air Transport Association of India which charges a small agency fee. In port towns, these firms also work as shipping agents, Commission granted to the agents is about 7½ per cent for passengers and 5 per cent for freight. Besides providing booking arrangements, the agents also provide for carting services. Normally airline business is done on cash basis, but credit is also granted to recognised booking agents and well known parties including newspaper firms. For external services firms only approved by I.A.T.A. can work as agents for passenger and freight traffic. The commission granted on traffic to the foreign countries is the same viz. 7½ per cent for passengers and 5 per cent for freight booked through the agents. The commission is not an additional expense to the clients since it is paid by the airline on the published tariff. The travel agents also do considerable publicity work. Circular letters and personal contacts play important part in sales promotion work carried by the agents. The agents also assist the shippers in preparing the air-freight shipping documents like the Air-Way Bill of which number of duplicate copies are prepared. International air freight shipments have to be further accompanised by requisite licences.[4] An Air-Way Bill is not negotiable and is

[4] A list of custom aerodromes in India is given below: (1) Bombay - Santa Cruz Airport (2) Bombay (Juhu) Airport, (3) Ahmedabad Airport, (4) Madras (St. Thomas Mount)

required to show (1) type of service, (2) method of routing, (3) the number of packages, (4) nature and quantity of goods, (5) the aggregate weight, (6) the shipper's declared value for carriage and for customs, (7) the amount of insurace, (8) charges prepared by the shipper or the charges to be collected from the consignee, (9) the name, address and signature of the shipper and (10) the name and address of the consignee.

For international shipments, it is of utmost importance that the shipper provides the airline with all the necessary papers and documents. Thus in India, besides the commercial invoice, import licence must be produced as imports into India are subject to an individual licence obtained by the importer.

NATURE OF AIR FREIGHT CARRIED BY THE INDIAN AIRLINES

Before the World War II, freight traffic was showing signs of expansion. In 1939, the total freight traffic carried by the Indian companies was as shown below:—

	Weight lbs.	Ton-miles.
(1) Excess Baggage and Freight	91,489	16,312
(2) Newspapers	6,960	964

On the external routes, air freight from and to India amounted to 230,000 lbs. in 1938-39. Bullion, precious stones, pearls, news-photos figured chiefly in this freight. During the war period, there was a race against time and cost was no consideration. Consequently, emergency cargo of all types came to be carried by the internal air services. Though, there was a large expansion in carriage and freight, its commercial aspect was very limited. When the internal services were restored to commercial operations in January, 1946, once again the freight traffic was looking up.

Airport, (5) Visakhapatnam Airport, (6) Calcutta (Dum Dum) Airport, (7) Delhi (Safdarganj) Airport, (8) Delhi (Palam) Airport.

TABLE 30

Volume of freight transported by the Indian airlines

Year	Excess Baggage and frieght		Newspapers	
	weight lbs.	Ton-miles	weight lbs.	Ton-miles
1940	28,578	8,963	20,274	2,750
1941	371,173	11,921	2,338	821
1942	163,237	86,131	5	2
1943	642,885	224,697	—	—
1944	1,163,725	361,531	—	—
1945	852,068	253,144	—	—
1946	1,318,153	390,126	567,573	139,780
1947	3,868,546	1,121,748	779,016	384,260
1948	8,156,471	2,093,439	3,818,265	733,586
1949	17,774,994	3,559,630	4,724,685	906,247

The following is the list of commodities which are usually carried on the domestic routes in India by the airlines.

1. *Machinery:* Motor cycles and motor cycle spare parts, tyres, and tubes, engineering spares and tools, dry batteries, Refrigerators and air conditioning parts, aircraft parts and equipment.

2. *Photographic Materials:* Cameras, spares, films exposed and unexposed and film publicity material.

3. *Electrical Goods:* Electric bulbs, fans, torches.

4. *Food stuffs:* Flour, sugar, salt, ghee, mustard oil, butter, vegetables, sweets, dried fruits, eggs and poultry.

5. *Chemicals and medicines, etc.:* Vaccines, drugs, surgical goods.

6. Hides, skins and leather goods.

7. *Perishable Goods:* Fruits, seeds, spices, flowers, fish fry and betel leaves.

Value of imports and exports by air — Karachi, Rangoon, Calcutta, Madras, Tiruchirapalli, Bombay and Delhi airports.

Period	Imports by air: General merchandise	Imports by air: Precious stones	Imports by air: Bullion and currency notes	Exports by air: General merchandise	Exports by air: Precious stones	Exports by air: Bullion and currency notes
Karachi	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
1931 ..	1,50,601	—	[illegible],801	[illegible]63		10,00,000
1932 ..	4,09,256	4,17,722	[illegible]3,766	[illegible],128		2,00,000
1933 ..	19,07,929	31,48,685	1,77,335	41,203	-	1,02,700
1934 ..	5,25,041	38,78,355	1,06,638	10,623	52,983	1,03,930
1935 ..	8,31,480	25,08,941	1 23,635	80 935	77,350	45,000
1936 ..	7,87,384	70,27,503	1,72,799	1,11,481	23,200	1,32,989
1937 ..	6,99,647	92,29,874	2,47,685	2,13,483	10,505	1,56,675
1938 ..	11,74,772	99,03,004	1,47,196	4,03,599	30,360	1,91,12,211
1939 ..	24,12,368	80,23,541	15,95,031	6,63,084	34,586	4,06,333
1940 ..	11,01,346	26,28,362	11,79,390	4,83,437	15,767	4,451
1941 ..	9,15,932	3,70,744	3,30,269	14,95,175	17,235	25,56,545
1942 ..	8,34,201	9,43,768	2 03,802	9,97,718	1,31,243	1,03,80,532
1943 ..	9,15,759	1,29,15,506	32,134	1,19,54,480	12,608	3,37,71,200
1944 ..	13,84,194	1,90,93,001	52,80,349	1,24,26,263	1,30,124	3,57,45,326
1945 ..	34,43,424	1,92,19,525	28,65,450	1,02,25,693	62,55,745	4,95,68,565
1946 ..	71,78,069	2,35,73,808	2,27,62,534	63,54,443	2,22,593	3,67,84,644
1947* ..	2,09,65,906	4,00,63,000	13,16,94,079	6,20,16,088	3,27,878	1,09,10,720
Rangoon						
1931 ..	—	—	—	—	—	4,54,790
1932 ..	1,808	—	—	225	—	22,58,563
1933 ..	3,697	—	—	—	—	—
1934 ..	9,890	—	—	612	—	—
1935 ..	27,056	—	—	625	—	—
1936 ..	25,655	—	—	251	—	—
1937 ..	38,005	14,799	1,11,562	11,778	—	42,245

* For nine months only from January to September 1947.

Period	Imports by air: General merchandise	Imports by air: Precious stones	Imports by air: Bullion and currency notes	Exports by air: General merchandise	Exports by air: Precious stones	Exports by air: Bullion and currency notes
Calcutta	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
1938 ..	28,160	30,807	—	12,297	—	—
1939 ..	33,694	44,350	—	75,437	—	40,000
1940 ..	80,075	5,831	—	1,76,268	—	17,77,000
1941 ..	1,13,963	8,452	40,000	1,78,014	—	15,76,442
1942 ..	35,552	4,682	2,70,396	11,43,791	—	1,75,887
1943 ..	1,84,002	25	—	6,88,716	—	—
1944 ..	3,91,912	—	—	16,52,672	—	—
1945 ..	—	—	—	—	—	—
1946 ..	—	—	—	—	—	—
1947† ..	8,41,569	1,02,602	8,64,391	9,50,623	—	25,000
1948 ..	88,10,264	10,47,162	13,93,652	1,02,07,648	—	9,75,000
1949 ..	87,42,790	2,28,245	14,93,292	90,49,640	52,922	7,00,000
1950 ..	1,08,13,799	77,622	1,48,393	64,27,959	52,561	10,75,000
1951 ..	96,01,471	57,744	83,341	90,05,205	1,89,099	10,50,000
Tiruchirapalli						
1939 ..	61	—	—	7	—	7
1940 ..	68	—	—	174	—	—
1941 ..	371	—	—	3,230	—	—
1942 ..	325	—	—	3,520	—	—
1943 ..	—	—	—	14,809	—	—
1944 ..	32	—	—	49,654	—	—
1945 ..	10	6,933	—	—	—	—
1946 ..	—	—	—	—	—	—
1947 ..	15,000	—	—	—	—	—
1948 ..	400	—	—	—	5,300	—
1949 ..	12,935	—	—	21,100	22,212	51,922
1950 ..	1,450	—	—	—	186,646	—
1951	—	—	—	43,605	695,166	—

† For the last quarter of 1947 only.

Period	Imports by air: General merchandise	Imports by air: Precious stones	Imports by air: Bullion and currency notes	Exports by air: General merchandise	Exports by air: Precious stones	Exports by air: Bullion and currency notes
Madras	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
1945 ..	—	—	—	1,88,675	—	—
1946 ..	48,550	—	—	2,68,589	24,400	—
1947 ..	11,29,898	—	—	8,93,476	—	—
1948 ..	9,06,008	—	—	28,51,303	—	—
1949 ..	21,49,944	—	—	13,09,417	85,151	64,041
1950 ..	18,34,515	—	—	23,44,927	1,25,235	17,27,055
1951 ..	20,11,157	—	—	72,55,847	1,27,919	—
Bombay						
1947‡ ..	73,17,083	24,52,672	22,99,050	6,93,249	17,160	—
1948 ..	2,18,87,884	89,10,586	25,00,256	1,81,61,917	4,13,066	—
1949 ..	2,85,77,341	17,36,793	3,18,44,079	65,83,515	1,66,667	1,57,676
1950 ..	2,65,86,561	38,48,655	5,96,43,156	75,41,666	1,54,304	12,98,402
1951 ..	3,05,96,906	64,37,649	16,31,32,807	1,07,18,735	4,75,948	8,97,519
Delhi						
1948 ..	14,11,636	64,076	—	18,62,287	745	—
1949 ..	20,91,580	—	1,635	5,23,341	—	—
1950 ..	33,26,884	—	34,989	22,32,820	—	15,912
1951 ..	42,31,121	10,530	2,31,823	45,77,098	20,876	1,71,184

‡ For the month of December only.

8. *Hardware material:*

9. *Utensils:* Aluminium goods.

10. *Textiles:* Piecegoods, silk material, cotton yarn, hosiery goods, zari goods and samples and woollen goods.

11. *Building material:* Pipes, corrugated sheets, bolts and nuts.

12. *Tobacco:* Cigarettes, Bidi and tobacco leaf.

13. Radios, Gramophones and Gramophone records, musical instruments, valves and radio parts.

14. Tea and tea garden implements.

15. General merchandise and stores, cane, tarpauline, umbrella handles, liquors, stationery, and toilet articles, dyes, plastic goods, sports material, lace, fountain pens, optical goods, deeds, commercial samples, travelling equipment, carpets, plate glass, perfumes, toys, footwear, hosiery and rubber goods.

16. *Newsprint and books,* printed matter.

17. *Dogs and wild animals* (very occasionally).

18. *Precious freight:* Gold in ornaments and bars, diamonds and pearls.

(See Table 31 attached separately.)

The goods which are normally carried on the external services to and from India are as follows:—

Aircraft parts, and accessories, baggage, betel leaves, cheese, chemicals, drugs and medicines, cinematograph films and film publicity material, clocks, watches and their parts and accessories, condiments and curry powder, embroideries, drawn work, needle work and lace, essential oils, feathers, furs, hides, leather belts and skins, gift parcels, internal combustion engines, instruments—dental, hospital, surgical and precision, jewellery, novelties, mica and musical instruments, newspapers, periodicals, tea seeds, spectacle frames and lenses, textiles; watches and photographic and optical equipment.

Most of the commodities listed above have a value high enough in relation to weight to support the cost

of air transportation. Aircraft has thus created a new traffic for itself but is not likely to make any serious encroachment upon the ground carriers. But new opportunities are constantly appearing for the aircraft for the carriage of freight both on the domestic and the external routes.

Though the freight traffic on the internal and external routes of India is increasing, there is an astounding lack of information on the part of the business community regarding the services and advantages offered by the airlines. The present shipping habits cannot be changed overnight and it would be necessary to educate the shippers in appreciating the advantages offered by the airlines.

EXCLUSIVE FREIGHTER SERVICES

Exclusive freighter services operated by Dakota are also being run on the following routes (1) Calcutta - Agartala by Kalinga Airlines, (2) Delhi-Srinagar by Indian National Airways, (3) Calcutta-Gauhati and Calcutta-Bagdogra by Airways (India) and (4) Calcutta-Agartala by Bharat Airways. These exclusive services are being operated largely on account of exceptional situations existing after the partition of the country and do not indicate future possibilities. An exclusive freighter service can offer cheaper freight rates than a regular passenger service as it need not carry the unproductive load of cabin attendants, food, water and other provisions that accompany the carriage of passengers. Thus, the average payload of a Dakota on the basis of average stage lengths of flight in India is 5,500 lbs. Of this, 21 passengers take about 4,200 lbs. leaving another 1,300 lbs. for mail and freight. A freighter Dakota is, however, allowed 700 lbs. more of gross ton-weight which means 700 lbs. more of payload and it has further 2,000 lbs. of payload in the saving it has, by not having the passenger equipment installed in the shape of seats. This load of 2,700 lbs. is 50 per cent more than the average payload of a passenger Dakota. In the case of exclusive freighter services, the freight rates can be somewhat below the

passenger rates per lb. Though all-cargo carriers are playing an increasingly important part in the air commerce of the world, India will have still to depend upon the combination aircraft for some time to come to carry freight for which speed is essential. As air freight rates, weight for weights, will be necessarily higher than rates charged by the surface transport, any large increase in air freight cannot be anticipated with any confidence.

The size of the future air freight market in India will largely depend on three major factors viz. how rapidly the freight rates are lowered, how much sales-effort is enlarged and the efficiency of the air freight operations.

CHAPTER XI

GROWTH OF NON-SCHEDULED AIR TRANSPORT IN INDIA

Growth of non-scheduled operations is essentially a post-war development in India assisted by war-disposal aircraft and retrenched Air Force personnel. There is a fundamental difference between scheduled and non-scheduled transport. Rule 3 of the Indian Aircraft Rules describes scheduled air transport service as an air transport service between places defined in a time-table or otherwise advertised, whether operating at regular prefixed times or not. The scheduled services are thus the time-table services. These services involve regularity, a fixed route identified by places served and operation for remuneration. Further, these services are operated for the public and normally operate irrespective of availability of payload on individual flights. On the other hand, non-scheduled air services represent an irregular type of transportation working on call and demand basis. The operator accepts for transportation such business as the public may offer. Another distinction between the two types of transport is that a non-scheduled operator cannot advertise his business as a scheduled operator may. Non-scheduled operations, therefore, require very successful salesmanship and efficient and elastic business organisation.

In India, non-scheduled operators need not approach the Air Transport Licensing Board as the D.G.C.A. can issue such permits in exercise of the delegated authority of the Government of India. The permit is granted for a certain period and the validity of the permit is subject to compliance with the Indian Aircraft Rules, 1937, and to all other laws in force from time to time and to obser-

vance of the conditions stated in the permit. Among the important conditions are:—

(1) That a single-engined aircraft shall not be used for public transport of passengers at night, except within a radius of ten miles of the aerodrome of departure.

(2) Multi-engined aircraft shall not be used for public transport of passengers at night unless the aircraft is equipped with radio apparatus approved by the D.G.C.A. for the purpose.

(3) Monthly returns of operations shall be submitted to the D.G.C.A. in the prescribed form.

(4) The operator shall ensure that no advertisement is made in any manner in respect of any non-scheduled air transport service.

(5) Every operator shall submit to the D.G.C.A. a schedule of rates and other charges for chartering different types of aircraft.

(6) Every operator shall send to the D.G.C.A. a list of all air-crew employed on aircraft to be operated under the permit.

(7) Each operator shall obtain a prior written permission of the D.G.C.A. or Controller of Aerodromes in respect of each individual flight operated, if a landing is to be made at any point other than the aerodrome of departure.

It is obvious that under the last condition, every operator has to obtain a permission for every flight undertaken. In granting the permission, the authorities satisfy themselves that the rights of the scheduled operators are protected on regular routes for which they hold a licence. If a scheduled airline doing non-scheduled operations is unable to undertake charter work, then alone a non-scheduled operator is permitted to accept charter work on a regular route. On irregular routes, this problem does not arise and it is in this field

that a competition between scheduled and non-scheduled operators arises. But even in this field, the scheduled operator is in a superior position as his licensed services offer him some guaranteed turnover and enable him to charge lower rates.

Among the most important non-scheduled operators may be listed Dalmia-Jain Airways, Air Survey Company of India, Indamer Company, Kalinga Airlines, Jamair Company, Nalanda Airways and Showays (India). These operators completed about 13,000 hours of flying in 1949 as against 11,000 hours of non-scheduled flying by scheduled airlines. There is no data available which may permit an accurate appraisal of the nature and volume of the services offered by these operators. Most of these carry freight and passengers on call and demand basis. Freight, rather than passenger traffic, has been the bread and butter for these non-scheduled operators. Traffic potential for passenger traffic has not been hitherto very large. Religious fairs have provided some casual traffic both to places in India and outside India. Similarly holiday and race traffic which is seasonal and casual have also provided these operators with some work. Their volume of business has not been however of such proportion as to constitute a threat to the scheduled airlines.

The organisation of non-scheduled air transport is more simple. Most of the operators maintain a fixed base from which they carry on their activities. Occasionally, an additional base is established if circumstances warrant. Thus, some of the operators in Western India are also maintaining an additional base at Calcutta. Most of these concerns are private limited companies organised by Managing Agents or private proprietors. Most of the operators maintain a Head office, an engineering section with one or more ground engineers in the control of the maintenance work and an operational section consisting of flying crew. The traffic section is usually attached to the Head Office. The labour costs of the operators are relatively low. Pilots in general receive salaries ranging from Rs. 800 to Rs. 1000

per month. When they exceed certain number of flying hours, the pilots receive in addition a flying bonus. As regards other employees, pay rates show wide variations and are settled individually. Some of the operators have no provident fund or insurance schemes for employees. The source and destination of business secured being not constant, the operators have to maintain a flexible plan for operation. For the most part, these carriers operate services over those routes which are not served by scheduled airlines and yet have a good traffic density. Intermediate points are not, however. served. Air Hostesses, in-flight meals and other services are eliminated, making it possible to reduce fares. Personal salesmanship plays an important part in securing business though some of the operators maintain paid employees at out-stations for getting business. Out-station bookings and transport of passengers and freight are also arranged through Booking Agents on commission basis usually at five per cent. The total amount of capital invested in this class of business is not known. Most of the operators have been using Dakotas which were available from the Disposals and their capacity to replace the Dakota with an equally good and efficient aircraft is doubtful as many of them rest upon financial foundation not sufficiently strong. It is quite likely that in future they will operate with a smaller aircraft which may, however, not possess the same advantage in matters of safety, range and speed. Since the operators practically have no ground organisation and are operating with limited overhead costs, their capacity to quote low rates has been a big factor in the keen competition on the irregular routes. To a certain extent, this competition has been quite healthy and has acted as a desirable check on the operating costs of the scheduled airlines. These operators provide, therefore, a "competitive spur" to the trunk-lines and also provide a yard-stick to measure relative costs and efficiency.

On the external routes, there has been a growing non-scheduled transport flowing to and from India.

Scheduled operators like Indian Overseas Airline had carried some charter operations with their Skymaster aircraft. Air-India International and Bharat Airways have been also recently carrying non-scheduled operations on the Bombay-London, Bombay-Nairobi and Calcutta Bangkok routes. Exeternal and internal scheduled operators have been doing increasing charter work which has provided useful opportunities to earn revenues by using equipment which may otherwise be standing idle. Non-scheduled operations by foreign operators are governed by international rules in addition to local rules framed by different countries for such operations. As far as possible foreign operators have been utilising the services of Air-India International for flights to the West and of Bharat Airways for flights to the East. Usually 7 to 8 per cent commission is granted by foreign non-scheduled operators to the Booking Agents. Uptil now, there has not been any serious effect of the operations carried by foreign non-scheduled operators on the volume of traffic carried by the Indian external services. In the near future, this phase of business activity is however bound to assume more important position permitting greater utilisation of aircraft and better experience of new foreign routes and markets. In the long run, all non-scheduled operations both in the domestic and exeternal field are bound to become integral part of the air transport organisation in the country. When such time arrives, these operators will be entitled to have their rights and privileges more clearly defined. In the meantime, some kind of control is necessary even in the initial stage to secure an orderly development of air transport and to keep the competition between non-scheduled operators and scheduled airlines on a higher level. The entry of non-scheduled operators into the air transport industry without dependence upon state assistance undoubtedly constitute a great experiment in the field of self-sufficient economy.

TABLE 32

List of Non-Scheduled Operators and the amount of flying done by them.

Name of the Company	Hours flown by non-scheduled operators during 1947 (a)	1948	1949
1. Dalmia Jain Airways (b)	3242.15	4261.29	745.30
2. Air Survey Company of India	3480.20	40.25	67.45
3. Segal Air Transport	78.45	49.30	—
4. Hindustan Airways Company	104.05	—	—
5. Mr. C. T. Quin, Jamnagar	—	154.55	—
6. Indamer Company	—	181.15	3803.05
7. Kalinga Airlines (c)	—	1386.32	4275.35
8. Jamair Company	—	183.30	562.55
9. Himalayan Aviation (d)	—	643.10	2771.59
10. Nalanda Airways	—	19.10	640.31
11. Shaways (India)	—	—	181.35
Total	6905.25	6919.56	13048.55

(a) Includes non-revenue flights as well.
(b) Became a purely non-scheduled operator from July, 1949.
(c) Became a scheduled operator in May, 1949.
(d) Became a scheduled operator in October, 1949.

TABLE 33

STATEMENT SHOWING THE COMPANIES WHO OPERATED NON-SCHEDULED FLIGHTS DURING THE YEARS 1950 & 1951 AND THE HOURS FLOWN ON NON-SCHEDULED FLIGHTS BY EACH ONE OF THEM.

Name of the Companies operating non-scheduled flights	Hours flown during 1950	1951	
1. Air-India Ltd.	7,094	1,947	
2. Indian National Airways Ltd.	1,743	3,292	
3. Air Services of India Ltd.	4,937	2,204	
4. Deccan Airways Ltd.	608	139	
5. Airways (India) Ltd.	1,505	836	
6. Bharat Airways Ltd.	3,253	2,457	
7. Air-India International Ltd.	276	264	
8. Kalinga Airlines.	5,609	5,178	
9. Himalayan Aviation Ltd.	2,314	4,074	
10. Indian Overseas Airlines Ltd.	1,118	—	Permit expired on 8-4-51
11. Dalmia Jain Airways Ltd.	453	—	
12. Air Survey Co. of India Ltd.	163	143	
13. Indamer Co. Ltd.	6,919	5,880	
14. Jamair Co. Ltd.	5,471	8,247	
15. Air Lift Co-operative Services Ltd.	209	2,736	
16. Darbhanga Aviation	2,257	3,993	
17. Nalanda Airways Ltd.	953	420	
18. H. H. the Maharaja Scindia of Gwalior	12	—	Permit expired on 30-11-51
TOTAL	44,894	41,810	

SOME PRINCIPAL NON-SCHEDULED OPERATORS

Kalinga Airlines, Limited

Kalinga Airlines was established in Orissa as a private limited company in 1946 with a capital investment of about Rs. 20,00,000 and a fleet of 5 Dakotas. It first started as a non-scheduled operator and between 1946 and May, 1949, operated mainly as a contract carrier, carrying freight in Bengal and Assam. In May, 1949, the Company was granted a provisional licence to operate a freighter service between Calcutta and Agartala. This licence was valid only upto 30th September, 1950. On 1st January, 1951, Kalinga was operating a scheduled freight service between Calcutta and Agartala with two to eight daily frequencies. Its route milage by end of 1950 was about 196.

Nalanda Airways, Limited

This company is also a contract carrier. It was organised in 1946 by the name "Verma Airways" but later took the name of Nalanda Airways, Limited. Owing to the shortage of flying personnel, the activities of the company were held up till 1st July, 1948, when the inaugural flight was made. The State of Bihar and the Maharajadhiraj of Darbhanga offered considerable assistance for the rejuvenation of the Company. The work of the company is supervised by a Board of Directors which consists of five Government nominees, five public directors and one Managing Director, who have uptill now worked in an honorary capacity. The Company is primarily engaged in charter operations. Since 6th October, 1951, the Managing Agency of the Nalanda Airways has been taken over by the Bihar Flying Club, Ltd., Patna. Under the financial arrangements, the flying club will get a monthly allowance of Rs. 500|- plus 10 p.c. of the profit. Under this scheme, it is likely that both the institutions may work more economically. The present strength of Nalanda Airways consists of 3 Fox Moths and one Navion.

Dalmia-Jain Airways, Limited, Delhi

This company was formed in July, 1946, with a paid capital of Rs. 3½ crores. The objectives of the company were to develop the business of sales of motor vehicles and aviation activities. In early 1946, the company purchased six Dakotas from the U.S. Disposals for commercial operations. After the formation of A.T.L.B., the company applied for a term licence to operate Calcutta-Allahabad-Delhi-Srinagar routes. The project, however, did not materialise. In 1947, the company was provisonally permitted to operate Delhi-Srinagar service and in 1948-49, was engaged in charter flights including Kashmir operations. Since then, the company was mainly engaged in charter operations. The company went into voluntary liquidation from June, 1952.

Indamer Company

No information is available about the paid up capital of this Company. Mr. Peter Baldwin, the Managing Director of the Company, has organised this concern mainly with a view to carry out charter operations in and outside India. Indamer has been working in close association with Indian Travel Service Ltd. incorporated in 1945.

CHAPTER XII

GROUND ORGANISATION

Commercial air transport depends upon the air route organisation and the ground organisation for its successful working. Aerodromes and airways are to the aircraft what harbours and highways are to the surface transportation. As commercial air transport is an improtant adjunct to Air Force, air route and ground organisation have also a strategic value. Since the very inception of air transport, governments all over the world have therefore invested large amounts of money in the provision of air route and ground facilities. For an efficient working of air services, the airways must be supported by visual aids, emergency landing fields, radio navigational aids and meteorological and communication services. The communication service has to be kept ready for all the twenty-four hours and must provide for exchange of meteorological and flight information pertaining to the safety of the flight. Radio equipped communication stations for weather service and for contact with radio equipped aircraft also serve as guides to aircraft in flight. Radio aids and other supporting services like the beacons assist the aircrew to remain on the route. In the post-war period following the World War II, progressive countries are providing for the control of aircraft by traffic lights and halt signals along the arterial skyways just like road traffic. Aiming at a fool-proof system of complete air safety, the controlling authorities have been devising plans for "Block signalling" down air corridors like main terminals. Each corridor is normally ten miles wide. At either end, there is "traffic cops"—Ground Controllers. They have every aircraft along the route in constant view on long distance radar sets which can penetrate the densest fog or the thickest cloud. The pilot and the ground controller are able to speak to each other by radio telephone. Spaced along the corridors

are instituted a series of radio beacons which serve the dual purpose of mile-stones and traffic signals. Just as a train is not allowed to pass a signal until the section ahead is clear, so the aircraft is not permitted to fly past a beacon until there is a clear course ahead. This system is already being established in the United States and the countries of the European Continent.

International Civil Aviation Organisation has been gradually extending the system of aerial corridors in the remaining countries of the world. The objective of the organisation has been to introduce an agreed system acceptable to civil and military authorities alike whereby an aircraft using the trunk routes can fly along the controlled lanes.

In each country, the airways are divided into convenient air-traffic control areas with jurisdiction over all aircraft flying in the control area. Each airway traffic control centre regulates the traffic in the control area, approves flight plans and informs the pilot with information regarding other aircraft that operate in its area. Each air-traffic control maintains an orderly flow of air traffic and keeps a continuous watch for each aircraft en-route within the area. The system of ground to air communication enables the control area to know the location of each aircraft to be checked as it passes out of one area into another and finally into the control area in which it is required to land. Along the air route, the aircraft reports its position to the nearest communication station which sends this information to take-off area and ahead to the centre in charge of landing area. With the aid of this information, the airway control authorities are able to know the exact position of the aircraft, its altitude and speed in the travel plan. The control authorities transmit their communications to airport traffic control and aircraft by radio facilities. In addition, the air-traffic control areas supply meteorological information to the pilot with a complete forecast for the whole of the period or for the route of his flight. The pilot is also able to get such information by radio during the course of his flight. For the purpose of airways traffic control, India is divided into four regions with Area Controls at Delhi,

Calcutta, Bombay and Madras. The traffic control system is also modelled on the standards and recommended practices laid down by International Civil Aviation Organisation. The existing organisation has grown, from the meagre start of four officers and a few subordinates to 100 officers and 1,500 subordinate staff.

The airport traffic control however has a very limited jurisdiction as it exercises control over the aircraft operating on the landing area and over aircraft in flight within the vicinity of the landing area. Aircraft are not permitted to land or take off without the clearance from the airport control which controls landing and take-off activities by radio-telephony. International airports maintain ILS (instrument landing system) and GCA (ground control approach) for assisting the aircraft to land during periods of low visibility. But both these systems as landing aids are still very expensive and it would take some time before they are widely adopted. Airports and the supporting services which they provide vary with the character of the airport. Inter-continental airports, trunk route airports and feeder line airports vary in size and are designed to accommodate different types of aircraft. Runway lengths, airport equipment and services to the passengers also vary according to the classification of the airports. Larger airports besides providing landing aids supply airport lighting, met services, fueling and servicing facilities and accommodation for company offices, postal authorities and hotel facilities. Generally, the equipment and standard of service rendered at the emergency or provisional airports is quite rudimentary. The increase in the size of the aircraft and the rapid growth of passenger and freight traffic have been making more exacting demands on the airports and have largely changed the character of airport facilities and services.

ROUTE AND GROUND ORGANISATION ON THE EVE OF WAR

On the eve of World War II, the workable route organisation was as follows. On the trans-India land-

plane route from Karachi to Calcutta, aerodromes were provided at intervals of 300 to 400 miles with facilities for repairs, refuelling, night flying and other supporting services. Most of the airports on this route were also available for night operations. In addition, a chain of beacons approximately 100 miles apart over the entire route from Karachi to Calcutta was almost completed. On the feeder routes, the organisation was more elementary in character. Some of the routes could not be operated in the monsoon season and were not provided with beacons. In the absence of radio stations, the necessary communication on the route had to be carried by regular telephone or telegraphic services. The standard of organisation was, therefore, just enough to produce the airmail services. Perhaps on account of the ever increasing technical demands on the trans-India route, the expenditure on the feeder routes was kept to the minimum. The airway control in the pre-war period was also very simple in view of the limited traffic. The officer in charge of a controlling aerodrome was expected to render all possible assistance to the aircraft flying within the section for which he was responsible. He passed on the information about the movement of the aircraft further along the route in order that lighting may be available at the appropriate time. He also issued special warnings and information, necessary for safe and efficient operation on the route. For the purpose of operational control, the Indian airways were also divided into three areas viz. (1) Trans-India airways, (2) Karachi-Colombo airway and (3) Karachi-Lahore airway, each area being under the charge of an aerodrome officer at the aerodrome controlling that section.

Between 1933 and 1939, there was a steady progress in the construction of aerodromes and landing grounds. Most of these were constructed by the Government of India both on the Trans-India and the feeder routes but after 1934, a few of the Indian States like Hyderabad, Mysore, Gwalior, Bhopal and Travancore also gave their active support to civil aviation by constructing aerodromes and landing grounds in their territories. Upto

1936, privately operated aerodromes and landing grounds in British India remained subject only to the administrative approval of the Government before being thrown open to public use. From March, 1937, the revised Indian Aircraft Rules were brought into effect with a view to control privately-owned aerodromes. Under these rules, a licence was required to operate private aerodromes and specific responsibilities were placed on the licencee in the interest of the public safety and uniformity of operational practice. This licensing system was expected to produce a higher standard of public safety and to guide aerodrome development along sound lines. So far as the Indian States were concerned, the States had the necessary powers to approve aerodromes in their territories. But the States desirous of constructing their own aerodromes usually consulted the Director of Civil Aviation in India and the standard in these Indian States complied with the standard of safety enforced in British India. By the end of 1938, there were nearly 58 aerodromes and landing grounds normally maintained in good condition in the Indian States.

TABLE 34

Growth of Aerodromes and Landing Grounds in India

Year	No. of aerodromes and landing grounds.
1935	159
1936	170
1937	170
1938	148 (reduction due to separation of Burma)

Of the 148 aerodromes and landing grounds in 1938, there were only 47 landing grounds which were open to the public and did not require previous sanction. Out of the remaining, 70 landing grounds were usually maintained in serviceable condition but required specific permission for use and the rest were normally maintained for restricted use only.

EFFECTS OF WORLD WAR II

Development of ground organisation before the war was largely conditioned by the extent of financial allotments from the general revenues which were limited and the progress was consequently slow. The ground organisation then existing could however provide a good part of the basic organisation for the commercial air services in the preliminary years. The war was responsible for many changes in the civil aviation works programme and demand continued to outstrip execution. In 1940, the Government adopted a new programme of capital expenditure for the development of air routes for use during the war, but planned with an eye on the post-war needs. Funds were concentrated to provide for higher standards for runway and aerodromes and good many new key aerodromes to open up new routes were also constructed. Both in respect of location and the type of building constructed, these were provided with an eye on operational considerations. But a large number of these aerodromes proved to be unsuitable for civil use as requirements of civil aviation are entirely different from those of Air Force. Considerable night flying was also done by domestic services during the war period. The technical devices at the aerodromes, necessary for night flying, were operated with the assistance of R.A.F. technicians who worked in India till the middle of 1947. When this personnel was withdrawn, there was not enough personnel available in India to operate the airports used by commercial airlines on 24 hours' basis.

The principal changes in aircraft and aircraft equipment which affected ground organisation during the war period were (1) higher speeds, coupled with higher wing loading (2) increased size, all-up weight and carrying capacity, (3) increased range and altitude of flight and (4) improved radio aids to navigation.

These far reaching changes demonstrated the need for larger aerodromes with longer, wider and stronger runways. The growing intensity of air traffic and increase in the number of air routes during the war period also involved some increase in the quantum of aerodrome and

air route organisation, apart from the raising of the standards. The air route pattern was now more stabilised and it was now possible to establish a realistic ground organisation plan designed to answer operational requirements for the present and the foreseeable future. It involved, in particular, the provision of more hangars, workshops, and technical buildings to provide the servicing stations for the operating companies and the Air Force. These circumstances ultimately led the launching of Post-war Programme of Civil Aviation Capital Works after 1946. In fact, while the war was still on, post-war plans for the development of civil aviation were drawn up and the task of implementing them was taken in hand soon after the cessation of hostilities.

With the growth of air transport in India during the post-war period, there has been a steady rise in the number of aerodromes. With the merger of large number of Indian States with the Indian Union, some of the aerodromes located in these States have been taken over by the Civil Aviation Department. The total number of aerodromes maintained and operated by the Civil Aviation Department was 72 by March, 1950. Of these, Bombay (Santa Cruz), Calcutta (Dum Dum) Delhi (Palam), are international aerodromes and are organized in every respect to receive international air services. Of these, Calcutta (Dum Dum) may be classed as one of the busiest in the world where more than 200 aircraft movements per day have often been recorded. Besides these, there are eight major aerodromes serving important administrative and commercial centres, 27 intermediate aerodromes serving lesser stations and 34 minor aerodromes.[1] Minor aerodromes at fairly important

[1] The nature of services and facilities provided by these depend upon the character of the aerodrome. Small aerodromes, where traffic is limited, provide an airfield with essential runways for taking off and landing and with minimum loading and unloading facilities. The larger aerodromes are equipped with landing and take-off runways, traffic control, office facilities for meteorological services and

places are used in emergency by the regular services and are also used as refuelling stops by short-range aircraft flying over the routes. India being a member of the International Civil Aviation Organisation, a programme for equipping the aerodromes to the standards prescribed by the International Civil Aviation Organisation is being gradually implemented. By far the most pressing problem is to bring India's aerodromes upto the post-war standards and to equip them with proper facilities. It is a long-term plan which may however take number of years to complete. The progress in this direction has been however slow due to the shortage of funds. In the meanwhile, efforts are being made mainly towards strengthening the equipment of the existing aerodromes and providing facilities at the aerodromes which are either under construction or being taken over from the Air Force.

A good point to point network of communication is also essential to any airways system to ensure fast transmission of weather information, air traffic movements and advices. The Aeronautical communication services has been re-organised since 1945 to provide aeronautical communication and navigation facilities for safe and regular operation of air services. Prior to that, radio communication service for aircraft was provided by certain stations operated by the Posts and Telegraphs Department. As a result of revolutionary developments in the technique of radio for aviation, it became necessary to organise a service exclusively for providing radio communication facilities to aircraft in flight. The total number of communication stations maintained and operated by end of March, 1951 was 52. Making a modest start with handful of stations providing the pre-war system of aeronautical radio communication, the existing organi-

customs authorities and night lighting equipment. Facilities for minor repairs and servicing, for ticket and baggage service and for warehouses are also available for airlines. Passengers are also provided with waiting rooms, hotel and postal facilities.

sation provides point to point communication, air-ground communication and navigation aids including radio range, Eureka Beacons, Blind Approach Beacon system and Instrument Landing system. Besides the opening of many new stations, considerable progress has been made in strengthening of the existing channels of communication. A new experiment is also being successfully carried out with the introduction of long range air-ground communication on Radio-Telephony at Delhi and Calcutta stations on the International Air-Ground Radio Telephony Circuit round the globe. Long-range radio telephone equipment is now being installed at Santa Cruz airport (Bombay). Similar equipment will be provided in the immediate future for Delhi and Calcutta airports. At present, aircraft have to communicate with air traffic control at the international airports like Bombay, Delhi and Calcutta by wireless telephone until they come within about 100 miles of the airport. The new equipment will enable the aircraft approaching any of these Indian airports to be in direct contact with the air traffic control from a distance of 1500 miles. India will have to adopt progressively radio-telephony as the primary en-route means of communication, but it would not be possible to effect an immediate change over from radio telegraphy to radio telephony because of financial and technical difficulties. Even the installation of I.C.A.O. standard short-distance radio and navigation aids may present difficulties for some time. The other main ancillary to civil aviation is Meteorology. The Indian Meteorological Department serves the needs of civil aviation. Route and area forecasts, adverse weather warnings and other meteorological reports are supplied by the Meteorological Department. The service provided to aircraft at all principal aerodromes is generally in conformity with the procedures recommended by the International Civil Aviation Organisation and the supplementary procedures for South-East Asia.

The air route organisation on the trans-India and trunk routes has thus registered a striking advance. Though considerable night flying was done by the in-

ternal services during the war period, it was subsequently curtailed on account of inadequate technical devices and the withdrawal of technical war personnel after 1947. Since then, and particularly after the introduction of Night Air Mail Services in January, 1949, provision has also been made to meet the requirements of the night air services for operations during the monsoon period. In the initial state of the night services, the ground organisation was adequate only for mail and freight services. Subsequently in 1949 and 1950 the ground organisation was developed to enable the night services to carry passengers even during the monsoon period. The ground organisation for all-weather flying has been now completed and the air services are operating throughout the year. The Aeronautical Communication Service also provides radio communication facilities to cover entire periods of flights by night. Attention has also been thus given to the provision of suitable communication, radio-navigational and aerodrome facilities at a number of localities on the various routes. But the present arrangements cannot be said to be adequate. Though provision of night flying facilities at all aerodromes on the scheduled air routes has been given priority, night flying is precluded on several routes in India owing to the absence of night flying facilities. The facilities for radio navigation are not adequate and it is necessary to install Radio Beacons and Airway Beacons connecting all stations so that navigation could be done solely with the aid of radio. Similarly full night landing and refuelling facilities have to be made available at alternate landing grounds and a full time watch maintained on the movements of the aircraft. Though the ground organisation facilities are not upto the standard obtained in U.S.A. and U.K., they are far better than those prevailing in most of the Asiatic Countries. As India is a member of the International Civil Aviation Organisation, it is under an obligation to carry out the technical developments in ground organisation and other aids. Implementation from time to time of I.C.A.O. regulation in this regard would maintain Indian standard with the required international standards.

STATEMENT SHOWING THE TOTAL EXPENDITURE ON CIVIL AVIATION DURING THE YEARS 1927-28 to 1950-51.

TABLE 35

Year	Recurring Rs.	Non-recurring Rs.	Total Rs.
1927-28			10,10,645
1928-29			5,20,753
1929-30	Separate figures of recurring and		14,52,212
1930-31	recurr not available.		16,98,773
1931-32			16,52,016
1932-33			9,33,042
1933-34			12,19,899
1934-35	13,93,095	73,876	14,66,971
1935-36	16,24,468	12,48,915	28,73,383
1936-37	20,85,470	22,21,067	43,06,537
1937-38	21,44,848	18,81,630	40,26,478
1938-40	29,83,886	19,59,786	49,43,672
1939-40	35,34,128	10,94,745	46,28,873
1940-41	78,69,434	14,41,571	93,11,005
1941-42	90,09,365	37,95,434	1,28,04,849
1942-43	1,17,87,702	52,10,581	1,69,98,283
1943-44	65,98,468	12,01,304	77,99,772
1944-45	52,65,444	5,67,878	58,33,322
1945-46	39,64,046	4,09,643	43,73,689
1946-47	1,08,95,600*	72,87,180*	1,81,82,780*
1947-48	62,96,779**	1,51,78,229**	2,14,75,008**
1948-49	1,95,65,000***	2,14,53,000***	4,10,18,000***
1949-50	2,35,08,600****	2,00,00,000****	4,35,08,600****
1950-51	3,14,08,000	1,49,98,000	4,64,01,000*****
Grand Total	14,99,29,333	10,00,22,889	25,84,39,562

* Final Review figures. Expenditure not available.
** Figures from 15-8-47 to 31-3-1948 only. Expenditure figures from 1-4-47 to 14-8-47 not available.
*** Final review figures. Final Expenditure figures not yet available.
**** Reduced budget grant.
*****Budget estimate.

WORKS PROGRAMME

Prior to 1934, an expenditure of Rs. 45 lakhs (approximately) on the construction and equipment of aerodromes and air routes in India was financed from the ordinary budget. In 1934, a programme of capital expenditure was adopted under which after sundry modifications upto 1939-40, expenditure totalling Rs. 95.5 lakhs was incurred. The original expenditure covered a number of small aerodromes and hangars with wireless stations mainly on the Trans-India route. The 1934 programme aimed at extending development to Karachi-Madras, Karachi-Lahore, Bombay-Calcutta and Calcutta-Madras air routes. The ever increasing technical demands, however, resulted in expenditure being concentrated on the Karachi-Calcutta, Karachi-Colombo and Karachi-Lahore air routes. The last war made further demands and in 1940, Government adopted a new programme of capital expenditure amounting to Rs. 222.5 lakhs for the development of air routes for use during the war, but planned for post-war needs. It was contemplated that expenditure would be spread over a period of seven years. The war and technical development again produced demands outstripping the provision. Funds were concentrated mainly to provide higher standards for runways and aerodromes. At the same time time, a number of key aerodromes to open up new routes were constructed. From 1942, the programme of expenditure was heavily reinforced by the Air Force, some part of this expenditure, both on the existing aerodromes and in respect of new aerodromes, replacing expenditure planned in the 1940 programme. The expenditure under the 1940 Programme was about Rs. 125 lakhs making a total of Rs. 265: 5 lakhs expenditure on civil Aviation Works by the end of year 1943-44. During the closing year of the last war, a comprehensive programme of Civil Aviation Capital Works was drawn up with a view to build up a sound ground organisation. On a rough estimate, the capital expenditure on these works was initially estimated at Rs. 15.5 crores, but the acutal experience during the post-war years has indicated that this was

a very low estimate and that much more will be required if ground organisation capable of meeting all the modern requirements is to be developed. India is a member of the International Civil Aviation Organisation and has to develop her ground organisation to conform to the standards laid down by them which are higher than the standards provided in the post-war plan. On account of the inflationary situation in the country, the Government decided in the middile of 1948 to bring down expenditure on capital works by postponing less essential works and by slowing down the progress of the works in hand. The position was, therefore, reviewed and the whole programme was re-arranged with a view to ensure that only essential and inescapable works were undertaken during the immediate future. The total expenditure incurred on the construction of aerodromes and the provision of ground organisation in India from 1924-25 to the end of 1950-51 amounted to approximately Rs. 9,92,00,000.

Though civil aviation has made considerable headway, its development has been slowed down during the current years on account of small provisions which have been made during the post-partition period. In years to come more changes will have to be introduced in the civil aviation organisation on account of the dynamic character of the industry. Some new activities will have to be provided for and some established activities will have to be provided for on an increased and a higher scale but with the restricted budget, progress on these lines will be necessarily slow.

The Civil Aviation Department is essentially a spending department but it also receives annually small revenues from the following sources:—

(1) Fees for grants and renewals of licences and certificates,
(2) Landing and housing fees,
(3) Rent of land and buildings,
(4) Receipts for light, power and water,
(5) Sales and miscellaneous receipts.

Revenues from these sources were estimated in 1945 tc amount to Rs. 39 lakhs each year during the initial

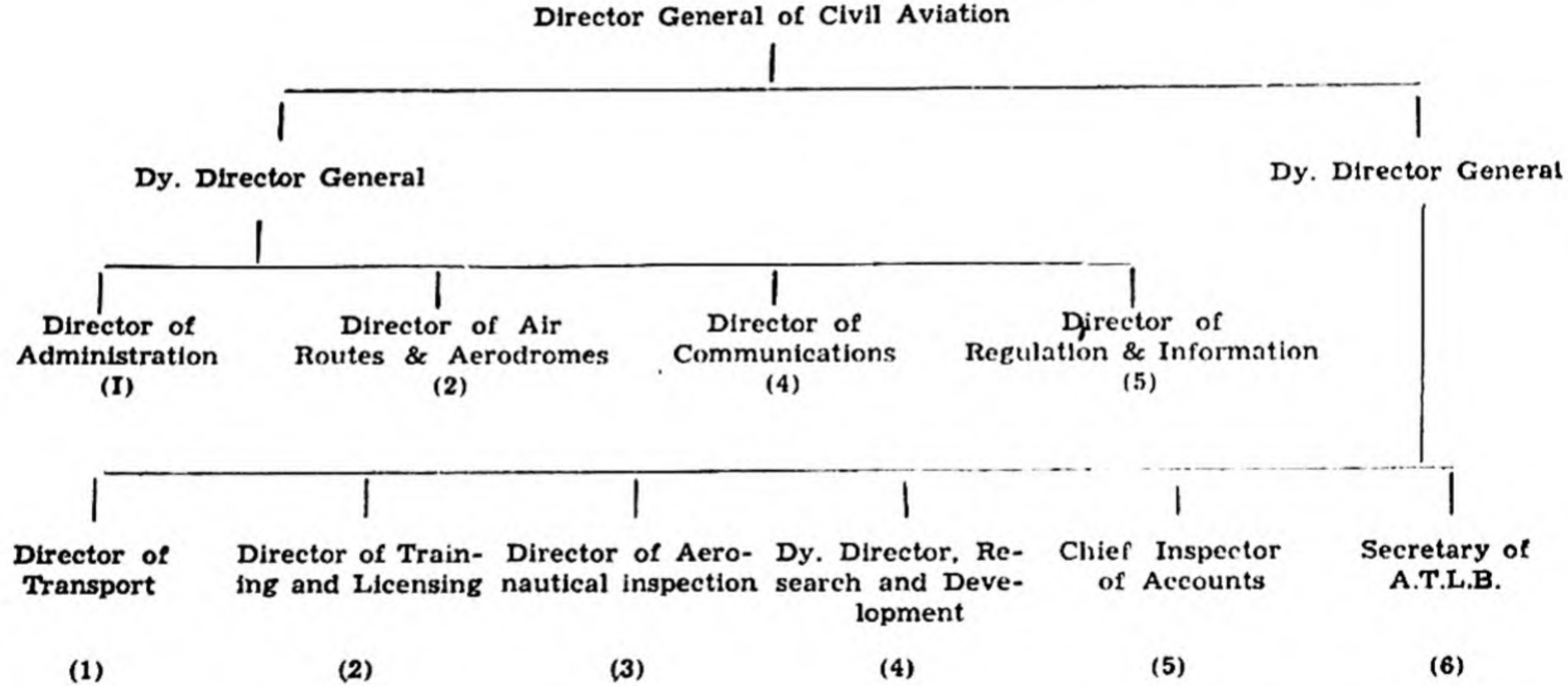
five years. This estimate appears to have been correctly made. With the growth of air transport, the revenues may however show progressive increase every year.

THE CIVIL AVIATION DEPARTMENT

The Civil Aviation Department was created for the first time in April, 1927. For a long time, the Indian Air Board was entrusted with the work of advising the Government of India on civil aviation problems. The Board was a part of the Department of Industries and Labour and consisted of the Secretary of the Department of Industries and Labour as the Chairman with the Air Officer Commanding in India, the Director General of Posts and Telegraphs, the Director General of Observatories and two representatives of the Finance Department as members. As members of the Board had other duties, meetings were few and consequently much delay occurred in the official business. For all technical matters, the Air Board depended upon the R.A.F. representative. This sort of arrangement proved to be inadequate with the growth of civil aviation and the standing Finance Committee of the Indian Legislative Assembly at its meeting on the 12th August, 1926 recommended the appointment of a Special Officer to organise civil aviation in India. The proposal was accepted by the Indian Legislature and the first Director of Civil Aviation assumed his charge on 5th April, 1927.

The organisation of the Civil Aviation Department before the last war was comparatively speaking rudimentary. Towards the end of the war, Sir Frederick Tymms, then the Director of Civil Aviation in India, prepared plans for the future development of civil aviation in India and the work of implementing them was taken in hand after the Reconstruction (Policy) Committee on Posts and Aviation had given their approval in 1945-46. The implimentation of the plan necessitated the reorganisation and considerable strengthening of the Civil Aviation Department. In the reorganised set-up, the Civil Aviation Department was placed in charge of the Director General of Civil Aviation.

Graph showing sanctioned Strength of Officers in the Head Quarters Office of D.G.C.A. (May, 1950).



The functions of the Civil Aviation Department are thus distributed among a number of Directorates. The principal among these are Air Routes and Aerodromes, Communications, Aeronautical Inspection and Training and Licensing. The Director General of Civil Aviation (D.G.C.A.) who is assisted by two Dy. Director Generals have under them Directors looking after the various technical branches. The head of the administrative organisations is the Director General who is responsible to the Minister for Communications. The D.G.C.A. is the main spring of the various activities carried out by the Civil Aviation Department. He is mainly responsible for the control and regulations of civil aviation in India, as also for advising the Ministry of Communications on policy affecting the civil aviation. As is inevitable in a specialised activity like aviation, very substantial control is retained at the headquarters by the D.G.C.A. The Air Routes and Aerodromes Directorate is mainly responsible for construction and equipment of aerodromes, their planning, administration and for regulation of air traffic operations. The Directorate also serves as a liaison with Air H.Q. India, on air route operation and development. The Directorate for Aeronautical Communications is responsibile for planning, organisation, equipment, administration and operation of the aeronautical communication service for safe and regular operation of air transport. It also serves as a liaison with Air H.Q. on radio organisation for Joint Air Force and Civil Aviation purposes. Both the Directorates of Air Routes and Aerodromes and Communications have large organisations throughout the country and are administered on a regional basis.

The Directorate of Aeronautical Inspection is responsible for ensuring the airworthiness of aircraft, which entails the supervision of materials from their origin to their incorporation in the aircraft and the daily maintenance of aircraft and the licensing and supervision of the personnel and organisations engaged in the work. It also assists the Air Transport Directorate with the technical advice concerning the engineering organisation of the various companies applying for licences to operate

regular air transport services. The organisation functions through four Regional Offices at New Delhi (Wellingdon), Calcutta (Dum Dum), Bombay (Santa Cruz) and Bangalore.

The Training and Licensing Directorate was started with a view to train Indians in the different technical branches of civil aviation. Prior to the war, the training of the personnel was largely done by the various flying clubs. The system worked satisfactorily then as civil aviation was not advanced. At present, training in various branches in aviation is imparted at the Civil Aviation Centre, Allahabad. A Communication School was also started at Saharanpur in 1946 but was subsequently transferred to Allahabad in December, 1950. It trains Radio Operators and Radio technicians. A Flying Training School and the Aerodrome School were opened at Allahabad in 1948 for the training of pilots and Air Traffic Control Officers. This division also attends to examination and licensing of pilots and other aircrew personnel.

A small Research and Development Organisation was established in the Civil Aviation Department in April, 1946, with a Deputy Director as the head of the Organisation. This organisation is mainly concerned with research into engineering problems relating to modifications and repair of aircraft, operational problems concerning aircraft performance at various aerodromes, development and use of indigenous materials for aircraft construction, giving advice in advanced aeronautical training and the encouragement of fundamental research in aeronautics. This branch has been also closely associated with the Indian Standards Institution in the preparation of standard specifications for aircraft building material and processes.

CHAPTER XIII

AIR TRANSPORT LICENSING BOARD

Before 1946, there was no regular system of licensing and the Government control over the airlines was very limited. The three airlines viz. Tata Airlines, the Indian National Airways and the Air Services of India, had only to observe the provisions of the Indian Aircraft Act of 1934, and rules there under in matters of licensing of personnel and the registration of aircraft. So long as any company conformed to the technical requirements of the Indian Aircraft Rules, it was open to it to operate scheduled services provided ground facilities were available. No control was sought to be imposed on route licensing which was left almost entirely to the discretion of the airlines themselves. This system worked well as air transport was then in infancy. When the post-war plans for the development of civil aviation were being formulated, it was considered necessary to have an independent body which could judge the economic strength and the technical capacity of the prospective operator and grant licences for the operations of air services having due regard to the needs of the traffic in each particular area and the orderly development of air transport in the country. The Government, therefore introduced a Bill in the February Session of the Central Legislative Assembly in 1944. Under the Bill, the Governor-General-in-Council was given power to make rules for the regulation of air transport services and the prohibition of the use of aircraft in such services except under the authority and in accordance with a licence authorising the establishment of services. The Bill was passed by both the houses of the Central Legislature and became a law in March 18th, 1944. Rules were accordingly framed for the establishment and operation of a Licensing Board. These rules were finally published on January 23rd, 1946 and were laid on the table of both the Houses

in accordance with Section 6 (3) of the Indian Aircraft Act. Under the amended rules, from 1st October, 1946, no scheduled air transport service could be operated except under a licence given by the Air Transport Licensing Board. Rule 147 of the Indian Aircraft Rules, however, provided that in the case of a scheduled air transport service which was in operation on 1st July, 1946, the Board was bound to grant a provisional licence, authorising the airline concerned to continue to operate the service until a licence was issued to it under Rule 141. Accordingly, Air-India (Successors to Tata Airlines), Indian National Airways, and Air Services of India who were operating scheduled services on 1st July, 1946, automatically obtained provisional licences in respect of most of their routes.

The first Board was constituted in October, 1946, with Khan Bahadur Din Mohammad, an ex-Judge of a High Court as Chairman, the Director General of Civil Aviation as Vice-Chairman and three members, one with special knowledge of aviation, another with special knowledge of financial matters and a third appointed in consultation with the Crown representative. Subsequently, it was considered that it was not desirable to have officials of the Civil Aviation Department as members of the Board. Rule 135 was, therefore, amended to provide that the Board should be composed of non-departmental men with high judicial and legal experience. A new Rule 135 A was inserted providing for the appointment as Advisers to the Board of the Director-General of Civil Aviation, a person with special knowledge of air transport and a person with special knowledge of financial matters. After the partition of the country, it was felt in October, 1947, that the Board did not really have sufficient work for the two wholetime officers in addition to the wholetime Chairman. As a result of a review made early in 1949, the Indian Aircraft Rules were again amended reconstituting the Board with the Director General of Civil Aviation and the Dy. Director General of Civil Aviation as members, abolishing the system of advisers to the Board, bringing the office of the Board directly under the administrative control of the Director

General of Civil Aviation, securing to the Government the power to issue temporary licences for the operation of scheduled services for six months and generally revising the procedural rules so as to secure more expeditious disposal of applications submitted by the companies for the issue or amendment of licences. The present form of the Board consisting of the Chairman, the Director General, Deputy Director General of Civil Aviation and Financial Adviser to the Ministry of Communications has been subjected to some criticism. The Director General represents the Government of India on the management of Air-India International while the Financial Adviser is a Director on the Board of the Deccan Airways whose Chairman is the Secretary to the Ministry of Communication.

The Air Transport Licensing Board thus constitutes the authority with the duty of examining applications for licences to operate air transport services and of issuing, amending, suspending or revoking such licences. The Board is empowered to grant a licence to operate an air transport service within India or from India to a place outside India and to impose such conditions as it may think fit. In exercising its discretion to grant or to refuse a licence or to attach conditions to a licence, the Board has to consider the need for air transport in the area concerned, potential traffic on the route, existing air services serving the area and the capacity of the applicant as an air transport operator. The Board has further to consider whether the financial resources and organisation of the applicant are sufficient to establish his presumptive ability to maintain the operation of the air transport service proposed to be operated. The air route over which the service is proposed to be operated must further comply with the minimum conditions set out in Section A of Schedules VIII of the Indian Aircraft Rules. Similarly, the aircraft to be used must comply with the minimum conditions prescribed in Section B of Schedule VIII of the rules while the technical personnel employed must satisfy the requirements of Section C of Schedule VIII of the Rules. The passenger fares and the freight rates

proposed, including any concessional fares and rates are required to be reasonable in relation to the cost of service and the prevailing fares and rates on other air and surface transport services. For these purposes, the applicant is required to produce a time-table of service proposed and a schedule of such fares and rates. Every operator is also required to submit to the Director General and the Board monthly returns regarding the operation of the licensed air transport services and other air transport operations as well as the annual returns regarding the financial results of the undertaking during each calendar year.

The Air Transport Licensing Board is, therefore, an autonomous body and a detailed procedure has been laid down in Part XIII of the Indian Aircraft Rules under which applications for the licences are required to be submitted to the Board, supported by exhaustive technical and financial data and the estimates. The data of the applicant is also analysed by the Director General of Civil Aviation who submits his technical report to the Board. The application is then published in the Gazette of India and is then made a subject of public hearing. The control of the Board over the operating companies is not however yet complete as the Board has no authority under the present rules to enforce maintenance of an uniform system of financial and cost accounting by all scheduled operators or to inspect their accounts.

CHAPTER XIV

INTERNATIONAL RELATIONS

Prior to the Second World War, the first systematic attempt to bring air transport under some kind of international regulation was made by the Convention signed at Paris on October 13th, 1919, by 38 nations including India. The Paris Conference established the International Commission for Air Navigation (I.C.A.N.) which guided and assisted the growth of international civil aviation during the two decades which follwed. The Paris Convention recognised the principle of full sovereignty of each contracting country over the air space above its territory and territorial waters and secondly the right of each nation to impose its jurisdiction over the air above its territory and territorial waters. Regulations were also drawn up for the definition and determination of such matters as the nationality of aircraft, standard of airworthiness, certificate of competency for aircrew, aircraft documents and procedure for aircraft operation.

HAVANA CONVENTION, 1928

The countries of the Western Hemisphere south of the Canadian border had maintained isolation for a long time. But they too finally concluded a similar agreement at the Sixth Pan-American Conference held at Havana in 1928 and adopted an air convention known as Havana Convention on Air Navigation. This convention defined broad principles of air transport, but it made no attempt to set up technical standards or to provide for the continuing discussion of common problems through the agency of a permanent organisation. On the eve of the last World War, the Paris and Havana Conventions were the principal multipartite conventions for regulating air transport between the different nations.

International air transport progressed steadily during the two decades following 1919. Then came the Second World War in 1939 and with it a tremendous expansion

in air transport. It now became quite clear that the pre-war conventions were inadequate for the constructive regulation of international air transport which was expanding at a very rapid rate.

CHICAGO CONFERENCE

With this background, the Chicago Conference was held in November, 1944. The most important result of the Conference was the drawing up of an International Civil Aviation Convention, the charter of a new body to guide and develop international civil aviation. This provided that 30 days after the governments of 26 nations (half of those present at the Conference) ratified the convention, the new organisation to be known as the International Civil Aviation Organisation (I.C.A.O.) was to come into existence.[1] In the meanwhile, a provisional body known as the Provisional International Civil Aviation Organisation (P.I.C.A.O.) was to function in the interim period. P.I.C.A.O. began to function in August, 1945 and was replaced by the permanent body, the I.C.A.O. on April 4, 1947. I.C.A.O. is now linked with the United Nations and thus forms a part of the general pattern of international co-operation. Among the international organisations with which I.C.A.O. works closely are: the International Air Transport Association (I.A.T.A.), the International Tele-communications Union and the International Meteorological Organisation. I.C.A.O. has done much to bring uniformity in the technical matters. Technical standards have been drawn up to apply to the international civil aviation including personnel licensing, rules of air, dimensional practices, operation of aircraft on scheduled international services and aeronautical telecommunication. India as a member of I.C.A.O. has been also keeping in line with these technical standards. Besides being a member of the Council of I.C.A.O., India is represented on the Air Transport Committee, the

[1] India ratified the International Convention signed at Chicago on 7th December, 1944 and deposited the Instrument of ratification on 1st March, 1947.

Finance Committee and the Legal Committee. Indian jurists have also played an important part in developing conventions on international air law to meet current needs. India's contribution to the total I.C.A.O. budget figure of Rs. 2,810,607, amounted to Rs. 3,26,000 in 1949.

Besides preparing the Convention on International Civil Aviation and the Interim Agreement on International Civil Aviation, the Chicago Conference adopted the International Air Service Transit Agreement known as 'Two Freedoms Agreement' and the International Air Transport Agreement or 'Five Freedoms Agreement'.

The 'Two Freedoms Agreement' provides that each contracting state shall grant to the other contracting state (1) the privilege of flying across its territory without landing in respect to scheduled international services and (2) the privilege of landing for non-traffic purposes such as repairs and refuelling. About 36 States including India have accepted this plan.

The 'Five Freedoms Agreement' is perhaps the most ambitious plan to remove the principal restrictions on the operation of the international airlines by multilateral agreement. Besides the first two freedoms, this plan provides (3) the privilege to put down passengers, mail and cargo taken on in the territory of the State, whose nationality the aircraft possesses, (4) the privilege to pick up passengers, mail and cargo destined for the territory of the State whose nationality the aircraft possess and (5) the privilege to pick up passengers, mail and cargo destined for the territory of any other contracting state and the privilege to put down passengers, mail and cargo coming from any such territory. Though some measure of understanding has been reached for the regulation of air transport, very few nations have come forward to accept the 'Five Freedom agreement.' On the other hand 'Air Transit Freedom' (two freedoms) has received a wider acceptance by several nations.

BERMUDA AGREEMENT, 1946

Ever since the Chicago Convention was concluded U.S.A. and U.K. represented two groups holding different

views over the restrictions to be placed on the fifth freedom. The group led by the United States favoured a liberal approach to the problems particularly in matters like the number of frequencies, carriage of the fifth freedom traffic and fixing of rates. On the other hand, the group led by the United Kingdom was not prepared to go so far and wanted some kind of regulation in these matters. But subsequently the United States and the United Kingdom came to an understanding and concluded an agreement at Bermuda in February, 1946, known as the Bermuda Convention. By this Convention of 1946, general principles were agreed upon for bilateral negotiations between U.S. and U.K. on matters in the Chicago annexe. The Convention besides incorporating the Chicago standard clauses provides that the disputes which cannot be settled through bilateral consultations are to be referred to I.C.A.O. for advisory opinion. The annexe to the Convention describes the extensive routes and traffic points involved. It also sets up a comprehensive procedure for determination of rates to be charged by airlines operating between points in the two countries. The conference also concluded a number of collateral understandings on the operation and development of air transport services under which no arbitrary restrictions were to be placed on capacity, number of frequencies, or fifth freedom traffic.

Under bilateral treaties based on the Bermuda Convention, the capacity offered by international carriers is supposed to be primarily determined by the through traffic offering to and from the country to which the carrier belongs. Intermediate or fifth freedom traffic is to be treated as "fill-up" traffic or a subordinate to the terminal traffic and the carriage of such traffic by an international airline or the capacity it offers for it, should form only a reasonably small proportion of the total. In order to afford the maximum flexibility to international operations and the greatest possible convenience to the travelling public, Bermuda type treaties between countries do not specifically restrict the amount of fifth freedom traffic that can be carried and they leave it to the carriers of each country to line upto the spirit

of the Bermuda Convention. Competition in the international transport is, however, so keen that this clause is often more honoured in the breach than in the observance. This had been particularly the case on routes between Europe and India where the capacity offered by some foreign carriers for traffic on this route, is grossly in excess of the requirements of through traffic to and from their country of origin. An unreasonably large proportion of the loads that foreign airlines bring to or take from India, often as much as 75 per cent. or more consists of fifth freedom traffic to which Air-India International and the B.O.A.C. have a more legitimate claim.[2]

Since the termination of the last war, India has concluded air transport agreements with Australia (1949), Ceylon (1948), France (1947), Netherlands (1951), Pakistan (1948), Sweden (1948), U.K. (1946), Iran (1948), Ethiopia (1948), Siam (1948) U,S.A. (1946), Philippines (1949). In the case of a few of these countries, temporary authorizations have been granted by India and the question of long term agreements with these countries is under negotiations. In the new agreement concluded between India and U.K. in December, 1951, the Government of India departed from their old policy. The new air agreement is a compromise between conflicting viewpoints on the issues raised by the Bermuda Convention initiated by the U.K. and the U.S. but to which India does not stand committed. The new agreement with the U.K. though basically conforming to the Bermuda pattern concedes some of the rightful claims of the Indian Government. Pre-determination of traffic requirements and the restrictions of the "fifth freedom" to a small percentage of total traffic carried as the third and fourth freedoms, constitute the basic principles held by India and which had been till recently the subject matter of dispute. In the new air pact, a compromise has been effected whereby operating permits granted by each government to operators

[2] Speech delivered by Mr. J. R. D. Tata at the Annual General Meeting of the Air-India International, Ltd. on 14th September, 1950.

of other Government provide limitation of capacities that may be provided by respective lines of either countries. It is also agreed that the 'fifth freedom' must be restricted to a small percentage of the third and fourth freedoms. Thus the acceptance of these principles gives support to a substantial measure to the basis of some of the recent air pacts entered into by India with countries like Australia and Philippines.

TABLE 36

Number of passengers travelling from and to India by foreign Airlines

Year	Total i.e. all companies	
	To India	From India
1930	73	70
1931	112	92
1932	207	200
1933	383	352
1934	398	479
1935	779	858
1936	1016	1174
1937	1230	1170
1938	1695	1609
1939	2177	2080
1940	not available	—
1941	3665	2770
1942	7097	5144
1943	5199	4975
1944	10030	9010
1945	16809	17004
1946	9162	11853
1947	not available	—
1948	26449	32064
1949	37432	43676
1950	44800	46068
1951	51628	49092

In terms of services, India stands to gain considerably in view of the facility of extending the U.K. route

to the U.S. The new agreement has raised an important issue of claiming a revision of the air pacts regulating the operation of air services with the countries like Holland and the United States which conform to the broad Bermuda pattern. At present airlines of both these countries apparently operate 'fifth freedom' traffic far in excess of what is permissible even in terms of the Bermuda type of agreement. It is, therefore, necessary that a fair proportion of the third and fourth freedom traffic rightfully belonging to the Indian airlines is retained. And yet the agreement provides for a realistic appreciation of the requirements of the public for air transport between India and United Kingdom territories. It is designed to promote the development of air traffic and to afford desirable flexibility to the airlines in the matter of providing capacity on their services, special encouragement being given to the carriage of freight.

Since 1944, very little progress has been made towards a multilateral agreement on commercial rights in international air transport. The right of airlines to engage in regular operation on specific international routes still depends upon bilateral agreements between states. By the end of 1950, about 238 such agreements were in effect and 125 were in various stages of negotiations.

CHAPTER XV

CASE FOR AN AIRCRAFT INDUSTRY IN INDIA

(1) IMPORTS OF AIRCRAFTS, SPARES AND ACCESSORIES.

On account of the small size of the air transport industry, India's needs for aircraft, aircraft parts and accessories were very limited before the last World War. Data for years previous to 1931 is not available. In 1932, for which figures are available, the total value of the imports was about Rs. 3,19,064. In the next year, i.e. 1933, these imports were more than doubled and stood at Rs. 8,18,174. For the next two years, i.e. 1934 and 1935, the imports stood at Rs. 8,08,565 and Rs. 8,16,605 respectively. The increase registered since 1933 was largely due to the inauguration of the two feeder services viz. the Tata Airlines and the Indian National Airways, Ltd. Partly it was also due to the imports of Atlanta and Dragon aircraft for the fleet of Indian Trans-Continental Airways, Ltd. The progress made subsequently will be illustrated by the following table.

TABLE 37

Imports of aircraft spares, spare parts and accessories

Year	No. of aircraft imported	Value of aircraft imported	Value of aircraft parts imported	Total value of aircraft and aircraft parts imported.
		Rs.	Rs.	Rs.
1934	32	4,06,140	4,02,425	8,08,655
1935	25	3,13,131	5,03,473	8,16,604
1936	30	6,43,580	8,04,408	14,47,988
1937	62 (29 for India and 33 for Afganisthan)	22,37,354 9,06,675	9,73,678	41,17,705*
1938	22	5,12,005	16,83,714	21,95,719

* The figure in the last column is the combined total for India and Afghanistan.

It will be noted that the sudden increase in the imports in 1937 over the previous years was largely due to the imports of 33 aircraft valued at Rs. 33,47,354 ordered by the Government of Afghanistan. In the next year, i.e. 1938, the imports had again registered a fall, but showed a substantial increase over the average for the previous years. Even then, an increase from about Rs. 3 lakhs in 1932 to nearly Rs. 22 lakhs in 1938 serves as a good index to the expanding aviation activities in the pre-war year. Information as regards the imports of complete aircraft, aircraft spare parts, material, etc. since 1938 is not available for study.

11730

METHODS FOR PROCURING SPARES AND STORES

Prior to the Second World War, there were only three air transport operators and the value of aircraft parts imported was small. With the growth of the industry during the war period and the post-war period, a specialised class of import firms has now come into existence. A few of the manufacturers' representatives have been also doing business supplying the Indian airlines with aircraft spares and stores. Messrs. R. K. Dundas (Eastern) Ltd. and Messrs. Greaves Cotton and Co. Ltd have been among the largest foreign importers in India. Indian airlines have been largely operating Dakota and most of the Dakota spares except for some critical items have been normally available from the Disposal sources such as Tata Aircraft, Ltd. The Indian airlines also place their orders with the local importers or stockists. The aviation stockists supply every kind of spare and accessory to the scheduled or non-schedule operators. Their services are, therefore, essential to the expanding aviation business in India. Most of these stockists are approved by the Government and hold a licence. Every item that enters the stockists trade is under a certificate of safety. As each item is issued, it also carries with it a Release Note. The total of the official Release Notes and the items still in stock are both checkable by the Aircraft Inspection Department of the Government of India.

These stockists are able to get best prices for their customers and make all the necessary arrangements for obtaining quick supply, quick shipping and necessary insurance. They also investigate all the new developments in air transport, aircraft accessories and equipment designed and manufactured in their respective countries and make regular reports on such developments. The Indian airlines, if they order the goods directly from the foreign sources have to pay an advance. On the other hand, the stockists in India are ready to give credit to the airlines, the credit period being normally 30 days. M/s. Air-India and Air-India International have, however, special arrangements for this purpose with Messrs. Tata Limited in U.K. and Messrs. Tata Inc. and Guy H. Evans in the U.S.A.

Some of the Indian airlines, however, find it cheaper to import the aircraft parts and stores directly from abroad. Direct imports also permit the airlines to save the commission that normally goes to the middlemen and further enable them to get discount that is applicable to customers. Due to the domination of the American aircraft, a large proportion of these spares and stores are from U.S.A. The normal procedure for the airlines is to send their applications with the detailed requirements to the import control authorities who fix a certain monetary ceiling for such requirements. The D.G.C.A. who is associated in the matter checks up the quantities proposed to be imported and recommends the extent to which import licences could be issued. When the D.G.C.A. has made his scrutiny, he forwards the applications to the import control authorities with his recommendations. The imports of spares and other material are mostly from Sterling and Dollar areas. Imports of this category were placed under the Open General Licence during the period September 1948 to June, 1949 and the importers were allowed to import as much aircraft spares as they wanted. Due to the critical Dollar exchange position, the import of complete aircraft from Dollar area was subsequently prohibited except in special circumstances. The import of com-

plete aircraft from Sterling area is, however, permitted though rigidly controlled.

A 3 per cent *ad valorem* duty is levied on aircraft spares imported into India. The present practice of customs in India is to levy a ten per cent duty on aircraft ground equipment, test equipment, tools, etc., a duty of 30 per cent on aircraft radio spares and equipment and a duty varying between 50 to 80 per cent on spares for motor vehicles required by airlines. In addition, the importing airline pays for insurance, marine freight, packing, forwarding and transport inland from the port of entry. The additional cost works out to 12 to 18 per cent in the case of shipments from U.S.A. and from 8 to 17 per cent for those from U.K. Thus, an Indian Company has to pay for normal shipments a price 15 to 20 per cent higher than that paid by a company in U.S.A. or in U.K. In the air transport industry, it is the normal practice for the operators to maintain spares in adequate quantities while at the same time conserving capital investment on such items. But in India, in the absence of a manufacturing industry the Indian airlines have to lay by large stocks of spares, sometimes, out of proportion to the milage of operation or to the original cost of aircraft. If the aircraft spares are not available in time, the aircraft becomes unserviceable and is grounded for a certain period thus resulting in a decreased utilisation and consequent loss of revenues.

In the peace times, India can rely upon a steady flow of imports of aircraft and aircraft spares from the foreign countries, but in the emergency period such imports may not be available. It would be, therefore, a sound policy to develop an aircraft manufacturing industry and miscellaneous industries manufacturing aircraft accessories so as to reduce the country's dependence upon foreign sources of supply. American and European airlines have their aircraft industries at their door-steps and for considerations based both on maximum security and self-sufficiency, it is essential to develop an aircraft industry when country's finances permit.

(2) HINDUSTAN AIRCRAFT, LTD.

Before the World War II, civil aviation was just showing signs of development and the need for starting an aircraft industry was not keenly felt. When in 1940, Mr. Walchand Hirachand and his associates decided to establish an aircraft factory at Bangalore, the question of manufacturing aircraft in India began to receive active consideration with the Government of India. The Government had also realised, by then, that in the absence of a manufacturing industry in India, the war-efforts of the allied powers would be seriously hampered in the Pacific theatre of war. In July, 1940, a series of conferences were held, between the representatives of the Government and Mr. Walchand Hirachand. These conferences served a useful purpose in clarifying the possibilities and problems of aircraft construction in India. As a result of these efforts, a joint stock company with an authorised capital of Rs. 4 crores was registered in Bombay in December, 1940, with the object of "manufacturing aircraft, airships, sea-planes, balloons and accessories," for the Indian market. At the inception of the company, Messrs. Walchand Tulsidas Khatau, Ltd. were appointed as the Managing Agents. The agency agreement was to be for a period of twenty years and the Managing Agents were entitled to a commission of ten per cent per annum on the annual net profits of the company. The concern worked under the control and supervision of a Board of Directors of which Mr. Walchand Hirachand was the chairman. The capital of the company was jointly held by Mr. Walchand Hirachand and his associates, the Government of India and the State of Mysore. The most difficult problem before the promoters was to get the technical personnel from abroad. The rise in prices of the plant and the rigid exchange control had introduced number of complications. The Government of India, however, agreed to assist the company in meeting some of the difficulties and further promised to purchase in the first instance fifty aircraft a year. Most of the other details were settled after prolonged negotiations between Mr. Walchand Hirachand, the British Resident at Mysore,

Sir Mirza Ismail, then the Diwan of Mysore and the Military authorities. In August, 1941, the first aircraft erected was Harlow Trainer monoplane. Several other types of aircraft were also assembled in the factory. In June, 1942, the Managing Agents resigned and the Government of India purchased their interests and took over the management. In view of the emergency, the Government thus acquired complete control of the factory which soon became one of the network of civil maintenance units which consisted of some 18 units set up in different parts of India. Of these, four major units were located at Bangalore, Poona, Dum Dum and Barrackpore. All the units were working on the basis of estimates and forecasts furnished by Air Command, South-East Asia and were engaged on repairing barrage-balloons, signal-equipment, aero-engines, propellers, wireless instruments and other items of Air Force equipment. The Bangalore factory soon acquired during a brief period, considerable experience of aircraft work and had the greatest number of staff operators experienced in working as a team on aircraft production. During this period, over 13,000 workers were employed in the Bangalore factory which compared favourably with a medium-sized factory in other parts of the world in equipment and production. In September, 1943, the U.S.A. Air Force had taken over the management of the factory from the Government of India as Managing Agents. With the termination of war, the U.S.A. Air Force gave up the Managing Agency on the 15th December, 1945. From that date, the factory came to be administered by the Supply Department of the Government of India. From 1st April, 1946, the company became a private limited joint stock company, with the Government of India and the Mysore Durbar as the only two partners with financial interest in the proportion of two to one. The present paid up capital of the Company is nearly Rs. 1,75,00,000/-. The Government of India will shortly invest Rs. 2 crores more in the factory. This additional capital required for expansion was being met solely by the Centre as the Mysore State have pleaded their inability to sink any

more funds the factory. Till recently, the company was controlled by a Board of Directors which consisted of (1) The Minister for Industry and Supply, (2) The Minister for Finance and Industry of Mysore and (3) Mr. J. R. D. Tata. The day to day working of the company was supervised by a Board of Management which consisted of (1) the General Manager, (2) the Director of Industries and Commerce, Mysore, and (3) a nominee of the Board of Directors. The management of the Hindustan Aircraft has undergone some change as the factory has been now left to the control of the Defence Department of the Government of India.

After the termination of the war, the Government of India decided to reconsider the whole question of establishing a manufacturing industry and invited an aircraft mission from Britain. The mission was led by Mr. J. B. Connolly of the British Ministry of Aircraft Production and submitted its report to the Government in May, 1946. The mission recommended that the aircraft production should be undertaken in the Bangalore factory as it was the only one having the longest experience of aircraft work and the greatest number of staff and operatives experienced in working aircraft production. Further, the Bangalore factory was the only factory in which the whole process of building an aircraft from semi-finished material had been attempted. At the same time, the mission has observed that a full-fledged factory cannot be developed at Bangalore unless there is certainty of orders forthcoming. Aircraft engineering is an expensive proposition and is also connected with the general engineering advance in the country. Until this state of engineering advance has been reached, recourse must be had to importation. Having regard to these conditions and the assets already available at Hindustan Aircraft Ltd. and the probable expansion programme in the first quinquennial period, they recommended a total expenditure not exceeding Rs. 130 lakhs. The mission also recommended state ownership of the aircraft factory and a full utilisation of the resources available at the Indian Institute of Science, Bangalore, for research in aeronautics.

WORK DONE AT THE HINDUSTAN AIRCRAFT, LTD.

Since the mission reported in 1940, Hindustan Aircraft, Ltd. has been working as an overhaul workshop for the aircraft belonging to the civil airlines and the Indian Air Force rather than as an aircraft factory. Strictly speaking Hindustan Aircraft is not a manufacturing concern as it mainly works as an overhaul, repair assembly and conversion depot for the civil airlines and the Air Force. So far, the factory has undertaken the work of aircraft conversion, aircraft repair and overhaul and engine overhaul for civil airlines and the Indian Air Force. Some overhaul work has also been done for the neighbouring countries. During the interim period, the factory also assembled and manufactured Prentice Trainers designed by Percival Aircraft Co., Ltd. of England. A scheme has also been approved by the Government for the manufacture of D. H. Vampire Jet aircraft in the factory under a licence from the De Havilland Company of United Kingdom. Recently a Design and Development Department has been organised, and designs for various types of trainer aircraft suitable for operation in India have been made. The manufacture of H. T. 2, trainer aircraft for civil flying clubs and the National Cadet Corps has been almost completed. This aircraft made its first trial flight on the 13th August, 1951. It is an all-metal monoplane (1000 lbs. gross weight) powered by the Gipsy Major 10 engines of 145 rated horse-power. The second prototype and production model of the present is powered by Cirrus Major engines of 155 H. P. HT-10, the second prototype of the trainer aircraft, was put to test during 1952. It is an improvement on the previous prototype of HT-2. Although HT-10 is in most respects similar to HT-2, a few significant changes have been effected in the second prototype. While in HT-2, the engine used was Gipsy Major 10, in HT-10, the engine used is Cirrus Major 3. Hindustan Aircraft hopes that HT-10 will live to the expectations of the designer Dr. V. M. Ghatge and prove to be really useful trainer aircraft satisfying all the requirements. The Hindustan Aircraft Ltd. is preparing

to manufacture 100 machines of this kind to meet the requirements of the Indian Air Force and the various flying clubs. With the production of H.T.-2 the first step towards self sufficiency in aviation— the design, development and manufacture of an aircraft in India may be said to have been taken. H.T.-2 was presented a certificate of airworthiness on 3rd January, 1953, by Mr. Jagjivan Ram, Minister for Communication. This presentation marks a definite stage of development in the aircraft industry in India. The production of H.T.-2 would now enter the production stage when a production certificate is obtained. The Hindustan Aircraft has also done some work in the fabrication of some of the spare parts required in overhaul work essentially for their needs. A considerable amount of general engineering work has also been done. As a subsidiary activity, the manufacture of all-metal rail-coaches has been undertaken and about 100 coaches of the new type had been built by 1950 and delivered to the Railway Board. The Hindustan Aircraft have also a proposal to develop this side of the factory. Production of all-metal bus bodies of various standardised types, both single deckers and double deckers, as a subsidiary industry, is also under active consideration. The quality of workmanship done at the Hindustan Aircraft compares favourably with work done in U.S.A. and U.K. So far the overhaul facilities are concerned, they are entirely confined to C 47 or Dakota type of aircraft. For other types of aircraft and engines, the Hindustan Aircraft, has no provision for special tools, and equipment. As the capacity of the factory is primarily utilised for the Air Force, the unused capacity is being made available to the civil airlines. Airlines in India are, however, showing growing tendency for self sufficiency in matters of overhaul of airframes and engines. There are no facilities for Viking aircraft or the Skymasters which fly on some of the internal routes. The Indian National Airways and Air-India do not therefore send their aircraft for overhaul to the Hindustan Aircraft. This policy of achieving self-sufficiency may grow with the increase in the size of the operating units.

Normally, a unit having a transportation of five million ton-miles may be regarded as sufficiently large for maintaining its own overhaul establishment. When most of the airlines have reached that level of operation, the Hindustan Aircraft, may have less work to do for the civil airlines.

So far the total expenditure on the factory at Bangalore is concerned, both capital and revenue expenditure from 1942-43 to 1945-46 amounted to Rs. 9.55 lakhs against which recoveries of Rs. 786 lakhs for work done or services rendered had been made from parties concerned, leaving an uncovered capital expenditure incurred by the Government since 1942-43 to 1945-46 at Rs. 179 lakhs. This amount included Rs. 82.1/2 lakhs on account of the Government share money, premium and solatium paid in acquiring the controlling shares and the complete control of the factory upto 31st March, 1946. During the war period, the Government had sterilized the interest of the Mysore State by paying them a solatium of Rs. 12.1/2 lakhs. All expenditure during that period whether revenue or capital and the losses, if any, have been met by the Government. During the war period, the Government had also advanced loans to the factory from time to time and at the end of the war, the amounts due to the Government were about Rs. 60 lakhs. Since the termination of the war, the value of production at the Hindustan Aircraft has been approximately Rs. 2 crores per year and may approximate to Rs. 3 crores when the factory is worked at its full capacity. The total number of employees at the Hindustan Aircraft exceeded six thousand by the end of year 1950.

Being the premier factory for overhaul and repairs of the aircraft, the Hindustan Aircraft, has also done some useful work in the promotion of aeronautical education. The Hindustan Aircraft, have already promoted various technical training schemes for the furtherance of technical knowledge and skill in the field of aviation. The organised training of young men at varying educational levels to fit them for occupations and professions within aviation industries was first conceived by the Hindustan Aircraft in 1947. The

practical and training schemes introduced since then consist of an advanced training, designed to develop the experience of the university graduates and to fit them for appointments in professional capacity in aeronautical industry and secondly a trade apprenticeship training scheme designed for the practical training of somewhat younger men with a lesser standard of education.

IMPORTANCE OF THE AIRCRAFT INDUSTRY

A well developed aircraft industry is an essential part of the air-power and has a vital bearing on the defence and communications of the country and as such aught to get priority in the future planning. The industry will have to be developed at the earliest reasoneble opportunity so that it may attain its full growth before another emergency arises. India cannot be strong unless supported by a manufacturing industry capable of rapid expansion if war becomes inevitable. The industry is a highly specialised one and plans have to be prepared for a considerable period ahead. At present, almost 100 per cent of the raw material required for the overhaul and repair purposes is imported of which 80 per cent comes from U.S.A. and the remaining from U.K. If transport aircraft have to be manufactured, heavy expenditure for research design and material procurement as well as for tooling will be required. A long period is required to bring a new aircraft or an engine from the initial design to the stage of production which may be upset by a new technical progress in aviation manufacturing. The rapidly changing technology which causes high rate of design obsolescence may thus break up production-continuity and spell high and unproductive engineering costs. In view of this risk, opportunities for profit are very limited. It is further uneconomical to manufacture a few aircraft and a large expenditure can be justified only when large number of similar aircraft can be absorbed by the market. In U.S.A. and U.K. the aircraft industry is largely producing to the dictates of the respective States and the Governments in these countries have been heavily sub-

sidizing manufacturing and research. It is doubtful whether India can embark on a large scale programme of manufacturing aircraft for civil airlines and Air Force in the near future. The Indian market is too small at present to support a full fledged industry and progress in manufacturing is bound to be slow. But in course of time, India will have to become self-sufficient in supplying all her aviation needs and a calculated and planned development of the industry may go a long way to create an atmosphere in which several other industries that may support aircraft manufacturing may also prosper. Aircraft manufacturing largely depends upon numerous basic industries. In the United States and United Kingdom, the aircraft manufacturers essentially engage themselves in producing the airframe and then assemble the various components, produced by different manufacturers. Engines, instruments, electrical equipment, engine ancillaries and airframe ancillaries are produced by specialised agencies. Aircraft manufacturing cannot be developed in India unless numerous other manufacturing firms are started. Before India makes a serious attempt to develop aircraft industry, it will be necessary to ensure the growth of these basic manufacturing units which contribute to the production programme.

This over-all development may also become a significant factor in reducing the maintenance costs of the air transport industry by supplying aircraft parts and accessories at cheaper rates. The contribution of the aircraft industry to the promotion of technological learning and research will be also of no small magnitude. The financial side of the question cannot be ignored in advancing these arguments. Progress towards this over-all development will be slow and yet India will have to be prepared to foot the bill for the maintenance of an industry which has paid no dividend in any country of the world.

APPENDICES

APPENDIX A

STATEMENT SHOWING THE NUMBER OF PILOTS (FOREIGN AND INDIAN) EMPLOYED BY AIRLINE OPERATING COMPANIES.

S. No.	Name of the Company	Position as on	Indians	Foreign	Total
1.	Air-India Ltd., Bombay	30-4-52	61	2	63
2.	Air-India International Ltd., Bombay.	30-4-52	21	1	22
3.	Indian National Airways Ltd. N. Delhi.	1-4-52	26	2	28
4.	Airways India Ltd., Calcutta.	26-6-52	53	5	58
5.	Bharat Airways Ltd., Calcutta.	1-4-52	36	4	40
6.	Air Services of India Ltd., Bombay.	30-4-52	11	3	14
7.	Deccan Airways Ltd., Begumpet.	1-4-52	48	1	49
8.	Himalayan Aviation Ltd., Calcutta.	10-6-52	13	4	17
9.	Jamair Coy Ltd., Calcutta.	April, 52	9	6	15
10.	Airlift Co-operative Services Ltd., Calcutta.	1-6-52	5	—	5
11.	Indamer Coy Ltd., Calcutta.	28-4-52	2	1	3
12.	Kalinga Airlines Ltd., Calcutta.	April, 52	11	2	13
13.	Air Survey Coy of India Ltd., Calcutta.	"	—	4	4
14.	Darbhanga Aviation, Calcutta.	8-3-52	5	3	8

APPENDIX B

A NOTE ON LITERATURE ON CIVIL AVIATION IN INDIA.

Commercial aviation is a new subject and literature on the subject is not very extensive though considerable literature dealing with the technical and engineering phases of the subject has been published. Standard text-books in the field of economics of transport make only a scant mention of this subject as it is not considered to have as yet come within the orbit of the economics of transport. Because of the intimate association of aviation with defence, there has been in most of the countries a marked reluctance on the part of the various governments as well as the airline operators to disclose any useful information. Sources of information from the United States are however comparatively more numerous. Bulletins published by the International Civil Aviation Organisation and the International Air Transport Association, Montreal, Canada, also throw considerable light on the technical and commercial phases of aviation. These can be conveniently consulted so far as the international aspect of civil aviation is concerned. For India, the printed literature is still more scanty. It is on rare occasions, such as during the official inquiry in 1950, that more light is shed on the important problems connected with the air transport industry. Besides sources of information outlined below, some information can be culled from the news items appearing in the daily press and periodicals in India. Though information can thus be obtained, more valuable information on the commercial side can be secured from interviews with persons who are connected with the commercial aviation in India and the official organisation that regulates it.

APPENDIX C

THE AIR CORPORATIONS BILL, 1953

This bill was introduced by the Hon'ble Minister for Communications in the House of the People on March 21, 1953. It provides for the establishment of two Corporations, one for the operation of long-distance international air services and the other for domestic air services and for services to neighbouring countries such as Pakistan, Ceylon Iran, Afghanistan and Burma. These Corporations will be called 'Air-India International' and 'Indian Airlines' respectively.

The two Corporations will take over the undertakings of existing air companies* as going concerns and the personnel of those companies who were employed by them before June 30, 1952 will be transferred to the two Corporations and their terms and conditions of service, unless altered by the Corporations, will continue to be the same.

CONSTITUTION OF THE CORPORATIONS

Each of the two Corporations shall consist of not less than five and not more than nine members appointed by the Central Government and one of the members shall be appointed by the Central Government to be the Chairman of the Corporation. The same person may be appointed to be the Chairman of both the Corporations or Chairman of one and member of the other and the same persons may be appointed to be members of both the Corporations.

FUNCTIONS OF THE CORPORATION

It shall be the function of each of the Corporations to provide safe, efficient, adequate, economical and properly coordinated air transport services, whether internal or interna-

* The expression 'existing air companies' means the Air-India Ltd., the Air Services of India Ltd., the Airway (India) Ltd., the Bharat Airways Ltd., the Deccan Airways Ltd., the Himalayan Aviation Ltd., the Indian National Airways Ltd., the Kalinga Airlines and the Air-India International Ltd.

Capital of the Corporations—(1) All non-recurring extional or both, and the Corporations shall so exercise their powers as to secure that the air transport services are developed to the best advantage and, in particular, so exercise those powers as to secure that the services are provided at reasonable charges.

CAPITAL OF THE CORPORATIONS

penditure incurred by the Central Government for each of the Corporations upto the date of establishment of that Corporation and declared to be capital expenditure by that Government, shall be treated as capital provided by the Central Government to that Corporation. (2) The Central Government may provide any further capital that may be required by either of the Corporations for the carrying on of the business of the Corporation on such terms and conditions as the Central Government may determine. (3) Each of the Corporations may, with the consent of the Central Government, borrow money for any purpose of the Corporation and secure the payment of any money borrowed by it or any interest thereon by the issue of bonds, debentures, debenture-stock or any mortgage or charge or other security on the undertaking of the Corporation or on any of its properties.

ACCOUNTS & AUDIT

The accounts of the Corporations will be audited annually by the Comptroller and Auditor General of India and any expenditure incurred in connection with such audit will be payable by the Corporations to the Auditor General of India. The accounts as certified together with the audit report thereon shall be forwarded annually to the Central Government who will cause the same to be laid before both Houses of Parliament.

RESERVATION OF SCHEDULED AIR TRANSPORT SERVICES TO THE CORPORATIONS

After the Act comes into operation, it shall not be lawful for any person other than the Corporations or their associates to operate any scheduled air transport service from, to, in or across India. It has, however, been provided that nothing in the Act will restrict the right of any persons to carry

passengers for the sole purpose of instructing them in flying or on duties of aircrews. Further, there will be no restrictions on any person to carry passengers or goods for the sole purpose of providing joy rides or for the purpose of aerial survey, fire-fighting, crop-dusting, locust control or any other aerial work of a similar nature.

FOREIGN-OWNED AIRLINES

Regarding foreign-owned airlines, the bill states that nothing shall restrict the right of any person for the purpose of any air transport undertaking, of which the principal place of business is in any country outside India, to operate an air transport service in accordance with the terms of any agreement for the time being in force between the Government of India and the Government of that country.

RESCUE OR RELIEF WORK

No restriction will also apply in case of any person who carries passengers or goods for the sole purpose of providing an air ambulance service or a rescue or relief service during any natural calamity.

COMPENSATION FOR COMPULSORY ACQUISITION OF UNDERTAKING

The compensation to be paid to the existing air companies for the acquisition of their undertakings will be based on the valuation of their assets after making due allowance for all liabilities. The assets will be valued with reference to the cost which each company incurred when it acquired a particular asset and provision for depreciation is made somewhat on the lines of the provisions contained in the Indian Income-tax Act, 1922. The principles of compensation are detailed in the Schedule appended to the bill and the amount of compensation in the case of each company is to be settled in agreement with the company on the basis of those principles. It is estimated that a sum not exceeding Rs. 480 lakhs may become payable on this account. Of this, about 10 p.c. is proposed to be paid in cash and for the balance, the Corporations will issue bonds bearing interests at 3½ p.c. per annum and redeemable at par at the end of five years. Both the interest and the redemption of the bonds are to be guaranteed by the Central Government.

CONSTITUTION OF SPECIAL TRIBUNAL TO DETERMINE COMPENSATION

In the absence of an agreement, the assessment of compensation will be made by a Tribunal consisting of three members appointed by the Central Government, one of whom will be a High Court judge. The decision of the Tribunal on any matter within its jurisdiction shall be final and shall not be called in question in any Court.

DUTY OF EXISTING AIR COMPANIES TO SUPPLY PARTICULARS

For the purpose of ascertaining what liabilities actually vest in the two Corporations, the bill requires existing air companies to furnish particulars of their liabilities and obligations within a specified time. Power is, however, given to the two Corporations to challenge before the Tribunal any particular transaction involving liability if the transaction had not been entered into in good faith or if it is considered imprudent. The Tribunal, after making such inquiry into the matter as it thinks fit, may make an order concelling or varying the agreement on such terms as it may think fit to impose and the agreement shall thereupon have the effect accordingly.

CONTROL OF CENTRAL GOVERNMENT

The bill contains adequate provisions for the exercise of suitable control by the Central Government of the activities of the Corporations which include the power to issue directions as to the exercise and performance by the Corporation of its functions. Neither Corporation shall, without previous approval of the Central Government, undertake any capital expenditure for the purchase or acquisition of any immovable property or aircraft or any other thing at a cost exceeding Rs. 15 lakhs.

MISCELLANEOUS

(a) The bill also makes provisions for certain incidental matters. Thus the two Corporations will work in mutual consultation in matters of common interest. The Central Government is also authorised to direct the transfer of scheduled air transport services or assets from one Corporation to the other for the purpose of improving the air transport

services or for effecting better co-ordination in respect of such services.

(b) The bill further provides for the setting up of an Air Transport Council and a Labour Relations Committee. The Air Transport Council will consist of a chairman and members not exceeding eleven appointed by the Central Government. The Air Transport Council will consider matters of common interest to the two Corporations. At the request of the Government, the Council may also investigate any matter relating to the fares, freight rates levied by the Corporations and may tender advice to the Government on financial matters relating to the Corporations.

(c) Each of the Corporations may also set up a Labour Relations Committee for promoting and securing amity and good relations between the employer and employees. It will be the duty of each Committee to advise the Corporation on matters which relate to the welfare of the employees. In addition each of the Corporations may appoint an Advisory Committee for the purpose of advising it in respect of any matter relating to the affairs of the Corporation.

FINANCIAL MEMORANDUM

The bill involves non-recurring and recurring expenditure to the Central Government. So far as non-recurring expenditure is concerned, it is estimated that a sum not exceeding Rs. 480 lakhs may become payable as compensation to existing air transport companies. A sum of Rs. 50 lakhs is stated to be also required for the administration of the Air Corporation Act—Tribunal etc. After the Corporations come into being, it may be necessary for the Central Government to advance loans to finance any approved schemes of major re-equipment or other capital outlay. These will be submitted to Parliament in the normal course as budget demands.

The bill provides for the setting up of an Air Transport Council. The recurring expenditure on the council and the staff, roughly estimated at Rs. 1 lakh per annum, will be met by the Central Government. During the initial period, it may be also found necessary for the Central Government to assist the Corporations by means of repayable advances to cover the excess of expenditure over income.

INDIAN PUBLICATIONS

1. *Memorandum of the Indian Air Board on Civil Aviation in India, May, 1926.*
2. *Civil Aviation Post-War Plans,* Government of India Press, 1945.
3. *Post-war Programme of Civil Aviation Capital Works,* Government of India Press, 1945.
4. *Record of Civil Aviation Conference,* 1st February, 1947, Government of India, Communications Department.
5. *Proceedings of the Indian Legislative Assembly and Council of State,* 1925-46.
6. *Proceedings of the Meetings of the Indian Standing Finance Committee* (1925-1939).
7. *Air Transport Inquiry Committee Report,* Government of India Press, 1950.
8. *Proceedings of the Union Parliament* published by the Government of India Press.
9. *Indian Aircraft Manual,* Government of India Press, 1950.
10. *Annual Progress Reports* published by the Indian Airlines.
11. *Annual Reports,* Ministry of Communications, Government of India, 1947-1951.
12. *Un-official Note on review of Civil Aviation in India* issued by Press Information Bureau, Government of India, 1946 & 1947.
13. *Progress of Civil Aviation.* Half-yearly Review issued by Press Information Bureau, Government of India, 1948-1951.

JOURNALS

1. *Journal of the Indian Aeronautical Society,* New Delhi.
2. *Indian Skyways,* Bombay.
3. *Indian Aviation,* Calcutta.
4. *Vayu-Path,* Calcutta.
5. *Monthly Newsletter* published by the Director General of Civil Aviation, Government of India, New Delhi.

GLOSSARY OF ABBREVIATIONS

A.T.L.B.	Air Transport Licensing Board.
B.O.A.C.	British Overseas Airways Corporation.
C.A.B.	Civil Aeronautics Board (U.S.A.).
C.A.T.C.	Civil Aviation Training Centre.
C. of A.	Certificate of Airworthiness.
C.T.M.	Capacity ton-miles.
D.G.C.A.	Director General of Civil Aviation.
I.A.T.A.	International Air Transport Association.
I.C.A.O.	International Civil Aviation Organisation.
m.p.h.	Miles per hour.

INDEX

A

Accidents, 15, 16.
Agreements bilateral, 226-228.
Aircraft industry, 233-240.
" selection, 26.
" overhaul, 154.
Air express, 177.
Air France, 105.
Air freight, 177.
" rates, 183-184.
" Commodities carried, 188-189.
" Commodities rates ,182.
Airline milage, 161.
Airmail, 168-176.
first airmail, 54.
development of, 171-175.
rates, 168-171, 175-176.
Air Priorities Board, 83.
Airport Traffic Conrtol, 203.
Air Transport Association of India, 135-137, 185, 186.
Air Transport Ltd., 126.
Air transport personnel, 131.
Air Transport Licensing Board (A.T.L.B.) 86, 87, 89, 90, 165, 174, 175, 183, 192, 218-221.
Airway Traffic Control, 202.
Akhaney & Sons Ltd., 126
All-India Airline Radio Officers' Association, 133.
All-India Aero Employees' Federation, 133.
All-India Licenced Ground Engineers' Association, 133.
Aviation stockists, 230-231.

B

Baggage allowance, 182.
Balloons, 53, 233.
Basic aircraft types 33-35.
Bermuda agreement, 224, 225, 226, 228.
Bewoor Gurunath Sir, 80, 135.
Birla Bros. Ltd., 126.
Block speed, 11, 31.
B.O.A.C. 36, 37, 66, 175, 226.

C

Cairo Conference, 55.
Capital, paid up, Indian airlines, 124.
Chicago Conference, 223, 224.
Civil Aviation Training Centre, Allahabad, 217.
Coach class service, 163, 167.
Connolly mission, 235.
Custom duties, 232.

D

Delhi Aero Club, 57, 171.
Departments, airline organization, 125-131.
Depreciation,
aircraft, 142.
other assets, 114.
Din Mohammad, Khan Bahadur, 219.
Direct & indirect costs, 157.

E

Empire Airmail Scheme, 61-64, 71, 173.
Engine overhaul, 155.
Equipment — standardization of 32, 33.

F

Fair return on capital, 157.
Feeder airlines, 49-51.
Finance, airlines, 118-123.
Flying boats, 36.
Flight personnel salaries, 150-151.
Fuel and oil, 144-145.

G

Ghatge V. M. Dr., 236.
Govan Bros. Ltd., 73, 126.
Ground control approach, 14, 201, 203.

H

Havana Convention, 222.
Helicopter, 51-52.
Hoare Samuel Sir, 56.
H.T.2 trainer, 236-237.
H.T.10 trainer, 236.

I

I.A.T.A., 114, 164, 165, 183, 184, 186, 223, 242.
I.C.A.O. 14, 107, 123, 135, 208-210, 213, 223, 224, 225, 242.
Imperial Airways Ltd., 36 57, 58, 62, 65, 66, 68, 69, 74, 78, 172.
Imperial Conference of 1922 56.
Indian Trans-Continental Airways Ltd., 58, 59, 61, 66, 74, 78, 229.
Indian Pilots' Guild, 132.
Industrial Policy Resolution, 95.
Insurance,
  aircraft, 148.
  third party, 148.
  passenger legal liability, 148.
  flying personnel, 149.
  passenger insurance, 149.
Instrument landing system, 14, 203, 209.

J

Jagjivan Ram Hon'ble Mr., 97, 237.
Joseph Lynn, 53.

K

K.L.M. 60, 105.

L

Labour relations, 132, 133.
Landing & housing fees, 152.
Land and seaplanes, comparison, 37.

M

Maintenance, 153.
  personnel, 154.
Managing Agents, 119, 126, 194, 199, 233.
Mercantile Airways Agency Ltd., 126.
Mirza Ismail Sir, 234.

N

Nationalisation of airlines, 95, 96, 97, 98, 110.
Navigators, 151.
Non-scheduled operators, 192-200.

O

Objectionable goods, 184.
Organization,
  airlines, 123-131.
  non-scheduled operators, 194-195.
  Civil Aviation Department 214-217.

P

Passenger fares, 165-167.
  insurance, 149.
Paris Convention on Ar Navigaton, 54, 222, 223.
Percival Spencer, 32.
Philippine Airlines, 105.
P.I.C.A.O., 223.
Planning Commission, 96, 97, 121.
Promotional rates, 163.

R

Recruitment of personnel, 133.
Regularity, Indian airlines, 18.
Reserved Coverage, 37, 38.
Roy K. K., 113.

S

Safety, 13-16.
Scindia Steam Navigation Co. Ltd., 107.
George Schuster Sir, 60.
Speed, 9-12.
Standardization of fleet, 32.
State assistance to airlines, 88-91.
Stores and spare parts, 229-232.

T

Tata Industries Ltd., 126.
Tata J. R. D., 226, 235.
Tapering principle in rates, 164.
Tasmania Empire Airways Ltd., 36.
Training of personnel, 135, 156, 217, 238, 239.
Tymms Frederick Sir, 73, 84, 85, 214.

U

Utilization of aircraft, 37-38, 40.
  of personnel, 40-41.
  and aircraft spares, 232.

W

Walchand Hirachand, 233.
Walchand Tulsidas Khatau & Co. Ltd., 233.
Warner Edward Dr., 10, 11, 16, 21.
Wireless operators, 151.
Wright Bros., 53.

11730

ERRATA

Page	Line	For	Read
22	5 from bottom	income-tax assesses of	income-tax assesses and of
28	24	it varies very nearly	It varies very nearly
28	6 from bottom	The high capital of the	The high capital cost of the
35	15	Convair'	The foot-note refers to Vickers Viscount and not to Convair 240.
39	Table 3	Bue	Bus
62	12 from bottom	followed	followed
64	14 from bottom	exceeded the estimated	exceeded the estimate
68	10	obtaining her propor share	obtaining her proper share
70	3	Madras airservice was	Madras air service was
70	16	was the single-engine	was the single-engined
76	18 from bottom	This Cmpany	This company
78	Table 12	Mains carried	Mails carried
82	9 from bottom	by the India Airlines	by the Indian airlines
84	7	Sir Frederic	Sir Frederick
85	8	"	"
86	14	issues	Issues
92	Table 17 year 1949	540	45 0
107	4	Scindia Messrs. Steam Navigation Comany	Messrs. Scindia Steam Navigation Company
111	Table 21 (under cargo)	101,028	1,010,028
165	12	Government concerned.	Government concerned.
186	16	Commission granted	commission granted
200	Page number at the top	209	200
211	Table 35	recurr not available	non-recurring, not available
212	8 from bottom	on civil Aviation	on Civil Aviation
225	last line	to line upto	to live upto